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TRANSPORTATION

No. 26



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MOTOR VEHICLE

RESULTS OF BSSR EXPERIMENT TO IMPROVE MOTOR VEHICLE TRANSPORT

Moscow PRAVDA in Russian 10 Sep 80 p 2

[Article by A. Andreyev, BSSR minister of automotive transportation, Hero of Socialist Labor, titled: "From the Experiment to the System"]

[Text] For six years the Ministry of Automotive Transportation of the Belorussian SSR has been working under experimental economic conditions. The essence of the experiment consists of the implementation of cost-accounting management for the branch, from top to bottom, and its self-financing, with guaranteed amounts paid to the state budget.

And what are the results? Transportation volume grew by 36.6 percent during these years, and freight and passenger turnover--by 51 and 40 percent, respectively. Labor productivity rose by 19.6 percent. We have switched over to a two-link management structure.

The transportation workers' responsibility to their clients has risen. Fulfillment of business contracts concluded with them has become a mandatory evaluation indicator when adding to the material incentive and worker bonus fund. And actually, it is this which is ultimately the most important, for the contracts define the specifics of the freight, its quantity and delivery deadlines.

Guided by such principles, the transportation workers of Belorussia fulfilled the freight shipment plan by 100.0 percent in 4 and 1/2 years. But still, the indicator in the state--freight turnover--only reached 98.3 percent; that is, they fell 534 million ton-kilometers short.

One of the paradoxes of the experiment being conducted is this: freight turnover, the traditional indicator for evaluating the plan, has become a restraining factor--or, more precisely, a hindrance--under current conditions and with the new economic approach, since it primarily reflects the quantitative rather than qualitative side of the matter, not the interests of the whole economy but just our profoundly departmental interests.

What does the indicator of freight turnover induce the transportation workers to do? To take more of the long-range routes and to load them more heavily, so as to "rackup" the ton-kilometers. Of course, with such an approach it is not hard to win (high output, low production cost, a reduction in fuel consumption). But what is to be done with clients who are "disadvantageous" for the transportation workers? They are kind of a burden.

Let me refer to some examples. Thanks to modern-day technological progress and the industrialization of the construction process, parts, assemblies, and structures with light components are becoming ever more widespread. Shipment of such cargo by automotive transportation--including special means of it--has increased as well. Large-dimension parts, air ducts, insulation, refrigeration units, and many other articles, while filling up the bodies of vehicles, at the same time fail to provide for full utilization of their weight-bearing capacity. Yet in the past few years the proportion of such shipments done by the republic's automotive transportation has grown by more than five times.

How should we handle this? How can the incompatible be accommodated? And this is no trifling matter. According to our estimates we "lose" more than a half billion ton-kilometers of freight turnover annually. Because of this the indicator of rolling stock utilization falls, fuel consumption increases, and other economic indicators drop.

And although we fulfilled the plan for our clientele and provided the state with real savings, the planning organs still lodged a complaint with the Ministry: why was the assignment not fulfilled for freight turnover? As you see, it is difficult to slip out of the firm "embrace" of this indicator.

Why do such things occur? At present it is firm amounts of transportation work (for a million rubles worth of industrial production, construction-assembly work, and goods turnover)--rather than the actual need to ship specific cargoes over specific distances, taking the production and supply plan, optimal assignment of supplier to consumer, and technical documentation for construction into account--that are taken as the basis for determining the size of freight turnover for the year and, even more so, for the five-year plan. Moreover, when drawing up the plan both the clientele and the transportation organizations strive to raise freight turnover. For the clientele this represents a possibility to create an appropriate reserve for ensuring transportation availability, and for the transportation organizations--a reserve for providing the plan with resources.

Experience shows that both parties approach the determination of size more responsibly when concluding business contracts for freight shipments. People know that they will bear material responsibility for failing to provide cargo or for shipment disruption.

What are the conclusions to be drawn from what has been said? The service branches of the economy need not freight turnover-- the size of which is nearly impossible to determine for a protracted, forthcoming period--but the volume of the shipments to be done (in tons) and their nomenclature, which is known.

Hence, our proposal: freight turnover should be changed from a mandatory indicator for the state plan into an estimated measurement of transportation work used in determining the resources needed to fulfill it. A reduction in the proportional value of freight turnover per unit of production should be envisioned in the economic plan by improving the disposition of productive forces, improving the efficiency of cooperation in production and designating suppliers for consumers. An important means for reducing transportation costs is seen to lie in this path.

Tonnage limits should be set in the yearly plans of the automotive transportation department on shipments for all branches of the economy, as should the calculated values of freight turnover, according to which shippers and transporters would conclude business contracts for delivery of cargo, with full material responsibility being borne by both sides.

In our opinion the level of operations in automotive transportation should be raised by changing the deadlines for working out plans well. What we are speaking about is the development of the transportation plans and the conclusion of contracts between suppliers and consumers, on the basis of which actual transportation requirements can be determined.

There are in the economy many shipments which, due to circumstances, entail the use of various vehicles which are paid for at an hourly rate. However, these rates do not at the moment ensure the profitability needed to cover our expenditures. Naturally, the automotive transportation workers are not economically interested in developing such a form of shipment. And again, a contradiction arises: what the consumer needs, is not advantageous to the automotive transportation concern.

The fullest possible satisfaction of the consumers' need for various types of shipping must be the primary criterion in evaluating the operations of our concerns. And another thing is clear as well: the economic relations between concerns/organizations and the transportation workers must be built on the basis of cost-accounting principles--remuneration for shipments should guarantee reimbursement for expenses and appropriate accumulations.

Now, about the means for enhancing the operational efficiency of the automotive transportation concerns and the branch as a whole. One of the main directions here is improvement in the use of primary stocks, and first of all--rolling stock. Over the three preceding five-year plans general use automotive transportation in the republic increased in size of shipments by nearly five times; in productivity per vehicle-ton--by 1.8 times. However, the pace of shipment growth, increase in number and qualitative changes in the rolling stock, and the intensity with which it operates have turned out not to be in balance now with capital investment for the development of the production base.

That this has led to, can be seen from the following fact. Currently, more than half of all the vehicles in the BSSR Auto-transportation System are located in enterprises whose capacity fails to guarantee the technical maintenance of the vehicles at the level of the indicators set forth in the five-year calculations.

The transition to broad use of containerized shipment is another large reserve. Currently the bulk of the containerized freight in the republic has been switched from railroad to automotive transportation. This has provided not only for rapid delivery to the consumer and good productivity for the rolling stock, but has freed more than 133,000 railroad cars and many railroad containers over four years of the five-year plan as well. It is planned to totally free railroad transportation from the need to transport containerized cargo over the territory of BSSR starting in 1981.

High-load diesel autotrains are being used ever more broadly in our republic. The production costs involved here are half as much as for single vehicles. If you consider that over 40 percent of the freight in intercity commerce is still delivered by medium capacity departmental vehicles which carry a load in one direction only, as a rule, then it is easy to imagine the gain that the economy would make by switching its shipments completely to general use transportation.

We also intend to raise labor productivity by improving the operational technology of the automotive prime movers that have two or three removable semi-trailers. Particularly marked advantages are to be achieved on the junctions between the automotive concerns and the clientele being served. According to our estimates productivity can be increased by at least 20 percent, while concurrently reducing the need for drivers. But a lack of semi-trailers impedes the broad introduction of this progressive method. The planning organs apportion prime movers and semi-trailers at a ration of 1:1, just as before. We are experiencing a lack of two-axle semi-trailers, including ones that dump.

A few words about our customers. The majority of them lack areas equipped for loading and unloading autotrains. The approach ways are maintained in poor condition, and there is no loading/off-loading equipment. Moreover, freight is dispatched only on one shift. For these reasons autotrains stand idle for a long time. In the past few years containers with a capacity of 10 to 20 tons have been increasingly used. They help conserve packaging and increase the efficiency of transportation resources. Hundreds of concerns in the republic receive containerized freight. However, none of them has the equipment for removing heavy containers. They are manually unloaded.

A steady reduction in the amount of transportation work done per unit of production and, consequently, a drop in the transportation costs of the economy--this is the chief standard for all branches of the economy.

9610

CSO: 1829

MOTOR VEHICLE

EXPERIMENTAL ENERGY-EFFICIENT MOTOR VEHICLES

Riga SOVETSKAYA LATVIYA in Russian 10 Aug 80 p 2

[Article by Novosti correspondent V. Eremin: "The Motor Vehicle of the Future Is On Its Way"; passages enclosed in slantlines printed in boldface]

[Excerpts] Serious attention is now being devoted to the search for more economical motor vehicle fuel and the development of new engines. In a conversation with a Novosti correspondent D.V. Velikanov, Deputy Director of the Interdisciplinary Commission on the Development of Electromotive Transport for the USSR State Committee on Science and Engineering and Corresponding Member of the USSR Academy of Sciences, outlined the studies under way in the USSR in this field:

The studies in the USSR are being carried out in many directions. One direction is the use of coal-derived gasoline. Our chemists have found several promising technological solutions which make it possible to begin large-scale production of such gasoline. Industrial-scale facilities for the conversion of solid fuel into liquid fuel are already under construction in Siberia and Estonia. The use of synthetic fuel under the conditions existing in the USSR, where there are large reserves of hard coal and [oil] shales, is also promising because of the fact that it does not require any basic design changes in the conventional internal combustion engine.

Another direction is the use of hydrogen as a fuel. Experimental models of hydrogen powered vehicles have already been built and will possibly appear on the streets of Moscow in the near future.

However there are still many difficulties facing the massive use of hydrogen as a fuel. For example, in order to convert the conventional ZIL-130 truck to liquid hydrogen fuel it is necessary to install bottles weighing nearly a ton and a half, which naturally reduces the cargo capacity of the vehicle. The gas in the liquid state requires a cryogenic tank and the cost of the vehicle will go up markedly.

Therefore it is considered more promising to use hydrogen as an additive to the gasoline-air mixture. This approach promises major advantages:

the fuel is burned considerably more fully and smaller amounts of toxic substances are present in the exhaust gases.

Trucks in which the gasoline tank has been replaced by a red bottle with the label "butane" or "propane" have been operating for several years in our large cities. Experience acquired in operating these vehicles has shown that under city conditions they are capable of competing successfully with their gasoline powered colleagues. Production of these trucks will be continued.

However, with all its advantages the large-scale conversion of motor transport to butane or propane is not very promising. This would require the creation of an extensive network of propane and butane filling stations. In addition, sooner or later the question will arise of the inadvisability of burning up a valuable chemical raw material.

The studies on the use of hydrofuel--a mixture of water and gasoline--are very interesting. These studies are being carried out at the Azerbaidzhan Academy of Sciences and at the Tashkent Highway Institute. Several buses using this fuel have been operating on the scheduled routes in Moscow for over a year.

Our scientists are carrying out studies and are developing or have already developed several experimental models of the motor vehicles of the future. Each of these approaches promises definite advantages, although it is too early to judge the specific advantages of any one of these directions. The future will show which direction is the most viable.

/The electromobile makes its challenge./ While giving due credit to the inventors and designers and their unconventional projects, we must admit that the future prospects are best for transport vehicles with electric drive.

Advanced models of electric powered vehicles were produced in the 1960's and 1970's. The first electrically powered vehicle in the world using alternating current was developed on the basis of the UAZ motor van; the conversion made it possible to reduce the weight of the vehicle, increase its range, and use a more compact traction motor.

At present four auto plants are involved with the development of electrically powered trucks and cars: RAF (Riga Auto Plant), ErAZ (Erevan Auto Plant), UAZ (Ul'yanovsk Auto Plant), and VAZ (Volga Auto Plant); several scientific and educational organizations in the USSR are also involved in these developments. The prototypes are now being tested.

Still the electromobiles cannot compete successfully yet with conventional motor transport. The primary reason for this are the short daily range and the low speed, which makes their use economically justified only for the carriage of small cargo loads in large cities.

In order for passenger cars, trucks, and buses with electric propulsion to be able to compete with the gasoline and diesel powered vehicles it is necessary to equip them with power sources of greater capacity, which will permit increase of the range to at least 150 km and the speed to that now customary on the main highways.

Our scientists are working hard on the solution of this problem. Along with the improvement of the presently used lead-acid and nickel-iron storage batteries, more advanced types of energy sources are being developed in the laboratories.

Thus, Leningrad specialists have developed a nickel-zinc battery which was installed in one of the experimental models of the ErAZ electric vehicle. This battery makes it possible for the vehicle to reach speeds up to 100 km/h and travel up to 80 kilometers without recharging.

The possibilities for the use of other types of batteries are being investigated: iron-air, zinc-air, lithium-sulfite-iron, and others, and also the so-called combined schemes. For example, a model of an electric vehicle has been developed at Erevan Polytechnic Institute, the batteries of which are recharged with the aid of a compact internal combustion engine installed in the vehicle itself.

/When will victory be celebrated?/ Of all the known types of batteries the scientists have the highest hopes for the sodium-sulfur variant. The distinctive feature of these batteries, in contrast with the conventional battery, is the fact that the electrolyte (beta-alumina) is in the solid state while the electrodes (sodium and sulfur) are in the liquid state.

These energy sources are capable of giving the electromobile both sufficient range on a single charge and high speed.

But first of all it is necessary to solve several problems. One is that sodium and sulfur can exist in the liquid state only at a temperature of plus 350 degrees. Consequently it is necessary to preheat the battery and then maintain it continuously at the required temperature. The achievements of modern electrochemistry, the successes in the field of technology, and also the availability of modern thermal insulating materials give a basis to hope that this problem will be successfully resolved.

Along with the electromobiles of the battery type, vehicles based on another principle of operation are being developed: direct conversion of chemical energy into electrical energy.

The most promising practical direction of these studies is the use in a fuel cell of oxygen and hydrogen. While such a vehicle must be "charged" in advance with hydrogen (in the liquified state or in the form of special metal compounds which are capable of soaking up the gas and then releasing it), the oxygen is obtained directly from the atmosphere.

So when will the age of the electromobile arrive? According to the predictions of the specialists serial production will begin in 10-15 years and by the beginning of the next century the electromobile will probably occupy a dominant position, both in the cities and on the superhighways. It is thought that trucks (up to one-ton capacity) will first come into wide use and then passenger cars and urban-type buses.

9576

CSO: 1829

MOTOR VEHICLE

GREATER USE OF TRUCKS PLANNED IN THE UKRAINE

Kiev RADYANS'KA UKRAYINA in Ukrainian 9 Sep 80 p 2

[Article by A. Hrusin, head of Odesskaya Oblast freight motor transport administration: "Truck trailers instead of freight cars"]

[Text] With the growth of the country's economy the problem of effective use of transport means acquires gradually more importance. The most urgent task now is to transport more freight faster with fewer freight cars, motor vehicles and boats. This effort is well supported by the complex competitive effort initiated by Odessites and approved by the CC CPSU in which sailors, dock workers, railway workers and truck drivers are taking part.

As a result, especially in the past few years, cooperation between neighbors increased visibly and the speed of the large transport production line grew. Today each partner plans his work considering his fellow worker. We, the truck drivers, work together especially with railway workers. We are also introducing progressive work methods widely. This includes direct load transfer, without shipment transfer (freight car - motor vehicle or the reverse), use of removable semi-trailers, promoting not only a decrease in freight car and motor transport idle standing and a decrease in rolling stock, but also a more reasonable second loading at the railyard.

Truck drivers have the opportunity and should provide railroad workers with more tangible assistance than up to now. I am referring to the urgent need to transfer a large load from the railway to trucks. Therefore, when we learned of the initiative by the Belorussian truck drivers, who decided to move all intra-oblast transport from the railway line to truck routes, we did not want to remain behind in this important matter. Thus, already during the 10th Five-Year Plan we are systematically relieving the railway of unsuitable short-run transport. Today this work is done by a specialized transport-expediting enterprise. During the last four years only administration trucks supplied oblast customers with 148,000 tons of these goods, as a result of which almost 5,000 freight cars were freed.

We established not only close contacts with railway workers in mastering new routes with readdressed goods, but also set before ourselves the task of accomplishing this transport in truck trailers.

This provided some additional worries for us. Of course, for organized and rhythmical supplying of oblast rayons, especially with popular demand goods such as footwear, groceries, clothing, etc., last year a terminal "Avtotranskonteyner" had to be constructed (which we did and put into use) with a park for universal container trailers. The circle of problems handled by the terminal is large: pick up and switching over from railway to truck transport trailer suitable freight for inside oblast communication; planning, strategy and line work according to an established schedule; organization of reloading work at the trailer terminal, storage warehouses, establishment of exchange points in load shipping and load receiving areas, and also in the outlying districts; setting up transport documentation and accounting operations, work with clients and advertising.

A series of measures were undertaken aimed at the establishment of normal work conditions for trailer terminals -- a staff of dispatchers, receivers and truck drivers was assembled, 400 three and five-ton trailers were acquired and also three truck loaders, an agreement was made with the Odessa railway loading service regarding the switching over of transport bulk.

As a result, already last year our truck transport carried more than 10,000 readdressed trailers to such destination points as Izmil, Kiliya, Holgrad, Sarata, Shabo, Kotova'k, Balta, Anan'ev. Now two more points have been added, Lyubashivka and Artaks. Our goal is to take up all intra-oblast deliveries in trailers.

I would like to draw attention to the fact that some people are put off by the imaginary rise in transport costs because railway tariffs have been exchanged for truck expenses. There is no need to anticipate this. Container trailer use or transport "from door to door" eliminates many additional laborious operations: production delivery to the dispatching station, truck unloading and railway car loading, and later the same operations at the destination station, truck transfer, delivery to customer...

Elimination of unnecessary transfers from the transport cycle, covers easily the difference between truck and railway tariffs, freeing the productive forces for other work. In addition, goods in truck trailers are delivered to destination points several times faster in very good condition.

The new progressive form of transport has found extensive support and propagation among the drivers of administration transport enterprises. Container trailer transport provides for a more effective utilization of

motor vehicle transport; a number of drivers from the Izmail truck association, for example, hook up two trailers in the beginning. The organization of assembly trailer lots by destination areas promotes a maximal utilization of truck runs. If during the first quarter of the present year this coefficient amounted to 0.6 here, in trailer transport it reached 0.9. There is a saving in gasoline and oil. More goods are transported with fewer trucks. Truck driver earnings rose by 23 percent. These are our reserves.

Unfortunately, even now not all enterprises are open to new ideas. One of the reasons for this is the unadaptability of their storage facilities to trailer unloading and large load trucks. For example, except for "Kazyk" no other truck can enter the "Kuyal'nyk" factory. The motor vehicle industry now puts out large capacity trucks; why doesn't the enterprise consider this and make appropriate construction changes? On many enterprises needed machinery is lacking, often trailers cannot be taken off tractors and the goods have to be unloaded by hand.

Yet, "Kuyal'nyk's" production and beer should be transported to oblast rayons only in container trailers. The oblast trade administration should also finally solve the problem of receiving goods from the "Tovarna" station in rayon food trade center storage areas so as not to have to deliver them to stores. This would allow for production transport in 20-ton trailers. Idle standing of railway cars being unloaded would be shortened, goods would not be spoiled. A number of city enterprises are putting off reconstruction of entry roads for receiving large capacity tractors with 20-ton container trailers.

The initial experience in the republic has recommended itself well. It can be multiplied, particularly by establishing an already necessary mechanization basis attached to the administration. An opportunity would be provided to render much-needed assistance to enterprises and establishments with cranes and other forms of unloading machinery. Both motor vehicle and universal 20-ton trailers are needed.

Experience shows that this principle may be applied to the organization of transport in the center of the republic, between the oblasts. For this purpose assembly lots for various directions should be set up in all cities. In any case, we are now studying the possibilities for setting up transport between Odessa and Kherson, and Odessa and Nikolaev. What will it yield? Quite a lot. Let us remember the hundreds, or thousands of trucks which cover large distances empty. If assembly lots existed the problem of same direction transport could be solved, not even mentioning the railway relief.

It is true that the problem of switching over from the railway to trucks and transport of goods within the republic in truck trailers is not simple; a coordinating center is needed. But it is a very real and necessary matter. It can be handled with more confidence. Then our railway worker partners will work more effectively. But, more importantly, national economic shipments will reach their destination points much faster than now.

RAILROAD

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RAILROADS ATTEMPT TO CONSERVE ENERGY

Moscow ZHELEZNODOROZHNIY TRANSPORT in Russian No 7, 1980 pp 10-12

[Article by A.I. Kolotiy, Chief of the Administration of Fuels and Heat Engineering, Main Administration of Locomotives, Ministry of Transportation; "Constant Attention to the Rational Use of Energy Resources"]

[Text] Rail transport is one of the large consumers of fuel and power resources in our country. About 56 million kWh of electricity, more than 12 million tons of diesel fuels, 10 million tons of coal, 2 million tons of fuel oil, 1.0 billion cubic meters of natural gas and more than 1 million tons of oils and lubricants are consumed annually to meet the needs of all railroad consumers. Reducing the energy costs for trains by just 1 percent will provide for a reduction of R 14.3 million per year in operating expenses.

Following the directions of the Party and the government for saving power resources in every possible way, railroad workers are constantly searching for more new reserves. As a result, for example, in 1978 786.7 million kWh of electricity, or 1.7 percent of the set norms for consumption, and 159.2 thousand tons of diesel fuel, or 1.0 percent of consumption, was saved in trains. Specific consumption of fuel and power resources for trains was 47.4 kg of reference fuel per gage [47.4 kg uslovnogo topliva na izmeritel'], which is 1.4 percent below the set plan for power resource consumption by locomotive.

At the start of 1979, the Ministry of Transportation established differential requirements for the railroads with regard to reducing diesel fuel and electric power consumption, taking into consideration the intensive operational situation. For 1979, on the whole, 124.8 thousand tons of diesel fuel, or 0.8 percent, and 166.7 million kWh of electric power, or 0.4 percent, were saved in trains. The locomotive depots at Gomel' and Orsha, Belorussian Railroad; Astrakhan', Pallasovka and Rtishchevo, Volga Railroad; Bel'tsy and Bendery, Moldavian Railroad; Tayshet and Ulan-Ude, East Siberian Railroad; Sosnogorsk and Sol'vychevodsk, Northern Railroad; Pomoshnaya and Znamenka, Odessa Railroad; Likhaya, Kochetovka and Povorino, Southeastern Railroad; and Sinel'nikovo, Krivoy Rog and Pyatikhatki, Dnepr Railroad made a significant contribution to these results.

Active work to spread the experience of advanced collectives and workers continues, and the efficient methods employed by engineers systematically to achieving economic fuel consumption during operation of trains are being studied and generalized. Engineers A.I. Shinkarev (Astrakhan' II depot), V.M. Kisil' (Volgograd depot), I.A. Khashov (Dema depot), M.I. Lebedev (Buy depot), G.G. Koval' (Sosnogorsk depot), I.P. Dan'shin (Georgiu-Dezh depot), V.D. Kravchenko (Rossosh' depot) and many others are among the experts at operating trains. Leading train dispatchers A.N. Kosynov and A.I. Karpushina, Vladimir division of Gor'kiy Railroad; Yu. A. Khlopinets, Zlatoustovskoye division of South Urals Railroad; M.N. Shapovalova, Belgorodskoye division of Southern Railroad; P.I. Lipets, Krasnoliman'skoye division of Donetsk Railroad; N.P. Glubokov, Moskovsko-Yaroslavl'skoye division of Moscow Railroad and others are making a large contribution toward insuring economical consumption of diesel fuel and electric power.

The engineering and technical workers dynamometric laboratory cars are actively participating in the search for railroad transportation facility reserves, in improving the quality indicators for use of the locomotive fleet and in the creative study and generalization of advanced experience from locomotive brigades in the efficient consumption of fuel and power resources. One of the most important goals for making experimental runs and traction-operating tests is the search for the ability to increase weight standards and the length of trains over entire routes. Because of this, on the Moscow Railroad alone, the growth rates for average train weight increased by 7.5 times for 1979 (compared with 1978), as a result of which 76 million tons of national economic goods were additionally transported. The initiative of the Muscovites, approved by the CPSU, is also finding broad dissemination on other railroads.

The basic factors influencing the operating efficiency of locomotives and consumption of power resources were established and quantitatively evaluated on the Belorussian, Southwestern, Northern, Lvov and a number of other railroads with the aid of the dynamometric laboratory cars, with recommendations and service charts for efficient locomotive operation being developed at the time. These aids permitted the train weight to be increased and the specific consumption of power resources to be reduced on a number of critical routes.

Regenerative braking remains a powerful technical means for conserving electric power. Because of the use of electric braking, 1.396 billion kWh of electric power was returned to the catenary system in 1978. This is 123 million kWh more than in 1977. The significant growth in the volume of regeneration is observed on the Northern, Transcaucasian, Kuybyshev, Sverdlovsk, South Urals, West Siberian and East Siberian mainlines. The increase in the reliability of electric circuits and the expansion of the track sections on which regenerative braking is used do much to promote this growth. Considerable attention is devoted to adjustment and tuning of the regeneration circuits at the locomotive depots of Tayga, Kemerovo Railroad; Nizhnedneprovsk-Uzel, Dnepr Railroad; Penza-3, Kuybyshev Railroad;

Zlatoust, South Urals Railroad; Chusovskaya, Sverdlovsk Railroad; Chop, Lvov Railroad and many others. Regeneration is also being used successfully on motorized car stock. For example, more than 5 million kWh per year is returned to the catenary network by electric trains from the Nakhbino and Pererva depots, Moscow Railroad.

As before, electrified a.c. sectors remain an important reserve for expanding the sphere for application of regenerative braking. Thus, for all of 1978, of the total amount of regenerative electric power, the amount falling to a.c. sectors was 57.7 million kWh in all. Such an obviously low level of power return is explained not only by the lack of necessary regenerative electric locomotives, but by inconsistent operation of the electrical circuits on existing a.c. locomotives in operation in the regeneration mode.

Series VL60R and VL80R a.c. electric locomotives with regenerative braking are in operation on only 3 railroads of the network, the North Caucasus, East Siberian and Far Eastern Railroads. In 1978, during the period in which the VL80R electric locomotives were in operation, 35 million kWh of electric power were returned to the catenary network on an 800-meter track section from Mariinsk to Tayset within the boundaries of the present-day Krasnoyarsk mainline. Delivery of the VL80R electric locomotives to the Far Eastern Railroad began at the start of 1979 to replace the VL60R.

Operational tests performed in January, 1979 showed that the VL80R has many advantages. When they were operated on one of the mountainous sectors of the railroad, the electric power return from each train operated reached 2000-3000 kWh, or 27 percent of the electric power consumption for traction, reaching as high as 40 percent in individual instances. Moreover, introduction of the VL80R locomotives permits locomotive productivity to be increased significantly and the locomotive fleet being operated to be reduced, thereby reducing the contingent of locomotive crews.

However, the VL80R still has serious shortcomings. These include, first of all, the unreliable operation of the control equipment, the rectifier-inverter transformer units, pulse formation units and other electrical equipment. This inadequately developed equipment is being eliminated by the industry extremely slowly, a fact which makes obtaining the highest savings from the new locomotives difficult.

It must also be noted that in 1979 the growth in the efficiency of regenerative braking was retarded on a number of lines by decline in the general level of operations and by shortcomings in the technical maintenance of the rolling stock. Nevertheless, the volume of regenerative electric power was 1347.3 million kWh.

Improving the use of fuel and power resources requires constant, purposeful work with regard to modernization of the locomotive fleet from a heat and power engineering standpoint. To this end, a comprehensive plan was drawn up for fuel and electric power savings in which, in particular, a series

of engineering efforts were planned for the Ministry of Transportation's repair plants and at locomotive depots. However, this plan is not as yet being carried out completely. Thus for 1979, outfitting VL60K electric locomotives with an improved ventilation system was carried out at a rate of 69 percent at the Ministry of Transportation's plants, and a single electric locomotive modernized in this fashion reduces the specific electric power consumption by as much as 6 percent. The locomotive depots are also bearing substantial losses due to a lack of serviceable converters for regeneration, the repair plan for which has only been carried out at a rate of 65 percent. The situation with regard to supply of serviceable NB429 and NB436 converters to the locomotive depots has come to be particularly unsatisfactory. The quality of repair for KD401 stimulators continues to remain low. There is also a lag in the installation of F.440 electronic counters on electric locomotives, in outfitting the TEZ diesel locomotives with a configuration for starting up the diesel engine from the generator of an attached section and with an air by-pass from the scavenging receiver of the 2D100 diesel section.

In 1979, the use of fuel and power resources on 13 railroads was checked by making fuel inspections in accordance with a plan approved by the Ministry of Transportation. The lines involved were the East Siberian, Sverdlovsk, Belorussian, Southern, North Caucasus, October, West Siberian, Odessa (-Kishinev), Moldavian, South Urals, Northern, Volga and Lvov Railroads, and 15 of the Ministry of Transportation's repair plants were involved. During the course of these tests, a number of substantial shortcomings in carrying out the Ministry of Transportation's directives to provide for economical consumption of all types of power resources was revealed.

On a number of railroads, including the Sverdlovsk, North Caucasus, South Urals and Volga, substantial losses in fuel and electric power had been permitted due to a change for the worse in the utilization of locomotives and a reduction in the level of technical maintenance of locomotives (diesel locomotives in particular). On these railroads, such locomotive utilization indicators as average daily productivity, average daily run and scheduled speed, indicators which influence power consumption, are not being met. Train delays because they were not received at stations have increased significantly, and idle time for locomotives at intermediate stations, turn-around points and primary depots has grown due to irregularities in traffic movement. For example, on the Volga Railroad, an extra 400 tons of diesel fuel was consumed monthly due to the indicated reasons, as well as more than 500 tons of fuel and 2.0 million kWh of electric power on the North Caucasus Railroad.

Work to reduce the dispatching of underloaded and short trains is not being carried out as it should be. Thus, it was established by inspection that every month more than 1,000 underloaded and 550 short trains are dispatched on the North Caucasus Railroad, and the figures are 1,700 and 400, respectively, on the Volga Railroad. Due to these causes, an additional 120 locomotives were required every month on the Sverdlovsk Railroad.

On many railroads, particularly the October, South Urals, Odessa and Southern Railroad, the numerous cautions not included in the traffic schedules result in significant losses in power resources. Thus on the Volkhovstroyevskoye division of the October Railroad, more than 30 lengthy cautions not included in the schedule were in effect during the summer, and there were 36 on the Leningrad-Moscow division. Because of this, more than 2.0 million kWh of electric power were expended unproductively every month on the aforementioned sections.

Significant losses in fuel are associated with diesel locomotives going in for unscheduled repairs, and with substandard quality of maintenance work. At many locomotive depots, the rheostat test positions for diesel engines are still not equipped with fuel consumption meters, therefore the specific fuel consumption is not checked, and diesel locomotives showing increased fuel consumption are not given rheostat tests a second time. A check has also shown that in certain locomotive depots, Orsk and Orenburg, South Urals Railroad, for example, the installations for diesel locomotive rheostat tests are in a state of neglect, sometimes even the rheostat testing manual not being available, and instruments on the control panel do not have the requisite accuracy.

Control over motor oil consumption has also been weakened. For example, at the Volkhovstroy depot, October Railroad, consumption of oils based on accounts for 1979 was 6.3 percent on the average for the TEZ series diesel locomotives (given an average consumption of 2.5-3 percent for the network), and it was about 8.0 percent for the TEP60 diesel locomotives (with the norm being 3.0 percent). It was established that the oil consumed during all types of repair is written off to operation.

Fuel requirements in stationary railroad power engineering is constantly growing. About 50 percent of all fuel required by rail transport is consumed to these ends. The development of thermal energy produced in-house has increased by 30 percent during the last five-year plan. Available power has increased by 21 percent due to construction of new boiler facilities, conversion to more progressive types of fuel and modernization and renovation of existing boiler plants.

Moreover, the specific norm for fuel consumption (per Gcal produced*) is being reduced at rates which are far from adequate. Thus, during the current five-year plan, this norm was reduced by only 1.9 percent. In 1978, it was 180.1 kg, whereas it was 166 kg in boiler units of the Ministry of Power and Electrification.

The decree of the CPSU Central Committee adopted in March of this year concerning the work of the Pavlodarskaya Oblast party organization with regard to conserving fuel and power resources at enterprises and building

*Tr. note--Since the Standard for Metric Practice has deprecated the unit 'calorie', it may be converted to joules using the following conversion factor: 4.190 02 E+00 for the 'mean calorie.'

sites obligates all economists to intensify the campaign for economic consumption of each kilogram of fuel and each kilowatt hour of electric power. The inadequacies in this matter are noted in the decree, and the most important tasks, those requiring immediate solutions, are determined. All of this concerns rail transport to the fullest extent, particularly its stationary energetics.

A number of serious shortcomings in norm setting for consumption and accounting for energy resources going for the production and public needs of railroads have been identified by the checks which have been performed. At many transport enterprises, the measures which have been developed for conserving fuel and electric and heat energy are not specific, often bearing only a formal nature, and they do not have the necessary technical or organizational base. Measures for varying the operating conditions of boilers as a function of outside temperature, the enterprise's operating procedures during working days and days off, and during the day and at night have not been developed and are not being taken in the boiler rooms of most enterprises. There is no effective system for providing bonuses to boiler room workers for efficient fuel consumption.

On a number of railroads, not all of the enterprises consuming fuel and petroleum products account for the use of power resources, and distortions in the actual state of affairs are permitted. There are as yet no senior heat and power engineers in the administrations for the Alma Ata, Transcaucasus, Donetsk, Odessa, Moldavian, Sverdlovsk and Far Eastern Railroads, in spite of Ministry of Transportation directives. All of this hinders an operative solution to questions for improving fuel practices, and sometimes makes it impossible, and it does not permit development of efficient, comprehensive measures for conserving fuel and heat energy in the stationary facilities. Moreover, practice shows that where purposeful work to improve the use of fuel is done according to plan within the power engineering service, good results are obtained. Personnel from the Northern Railroad may serve as an example of a responsible, creative relationship to solving questions concerned with improving stationary heat engineering. Here a careful analysis of boiler and furnace fuel consumption is made quarterly, and long-range plans for centralization of boiler facilities, etc., are being developed and realized.

The role of social organizations, coordination of the activity of which is performed by sections of the DornTO [Railroad Board of the Scientific and Technical Rail Transport Society] in the railroads' administrations, is great in the matter of further reducing consumption of all types of fuel and power resources. They study and generalize the advanced working methods of individual production leaders, enterprises, brigades, columns and collectives, and they disseminate their experience to the railroad. NTO sections control the progress of the incorporation of the most valuable proposals with regard to economical power consumption at enterprises, organize advanced experience schools and participate actively in the development of scientific and technical measures to improve the energy efficiency of locomotives and stationary installations.

The NTO organizations of the Belorussian, Northern, Lvov, Gor'kiy, Transcaucasian, Southern and a number of other railroads are doing much with regard to conservation of energy resources. Thus, advanced experience schools on saving fuel and electric power were held on the Northern, Belorussian and Lvov Railroads, employing a dynamometric car. Service charts for economic operation of trains are being developed sector by sector using the laboratory car. Experience in using a computer to set power consumption norms for trains has been generalized on the Northern Railroad, and a comprehensive quality control system for diesel locomotive repair has been incorporated and is being further developed in the Sol'yichegodsk depot. A topical, public review was held on the Southern Railroad with the aim of attracting a wide circle of scientific and technical society and production innovators to the development and incorporation of proposals directed toward economical consumption of fuel and electric power. A diesel locomotive diagnostics flow-line has been established at the Osnova locomotive depot for the first time in the history of the railroad network. This line, together with other measures, permitted the number of times diesel locomotives are coming in for unscheduled repairs to be reduced significantly and their energy efficiency to be improved.

In the concluding year of the Tenth Five-Year Plan, new and more complex problems have been posed for the railroad workers with regard to providing zealous, proprietary consumption of fuel and electric power. The Ministry of Transportation has confirmed a comprehensive plan of basic organization-technical measures for the economical use of fuel and power resources in 1980. The plan specified maximum reduction of fuel and electric power costs by improving the organization of train traffic, improving the condition and utilization of rolling stock, modernization of the locomotive fleet and dissemination of advanced experience.

Increasing the weight norms for freight trains over a section of track 10,000 kilometers long is specified in the new traffic schedule. It is planned to return 1,460 million kWh of regeneration energy to the catenary system. No less than 13.2 million kWh should be returned to the system during rheostat testing of the diesel locomotives, including 8 million at repair plants and 5.2 million kWh at locomotive depots. The laying of 4826 kilometers of weld-free track, refinishing of 57,000 kilometers of rail and surfacing of 85,000 worn frogs are specified. It has been planned to eliminate 300 unscheduled cautions calling for reduced traffic speeds.

It has also been planned to convert 27 boiler facilities to progressive types of fuel and to eliminate 142 uneconomical and small boiler units by centralization of the heat supply and putting large district heating points into operation, outfitting 35 boiler units with installations for treating water before the boilers, etc.

In the area of modernizing the locomotive fleet, it is specified that 160 VL60K locomotives will be outfitted with an improved ventilation

system for the electrical equipment, 36 ER22 sections will receive a more efficient regenerative braking system, 100 electric locomotives will get electric units to heat the passenger cars, etc.

Realization of the planned program will permit us to improve the energy-efficiency of transport operation and it will become a significant contribution of the railroad workers to the solution of the important national economic problem of all-out improvement in the use of fuel and power resources.

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RAILROAD

KAZAKHS, UZBEKS ASSIGNED TO BAM SETTLEMENT CONSTRUCTION

Moscow KONSOMOL'SKAYA PRAVDA in Russian 21 Aug 80 p 2

[Article by G. Gerasimovkch, secretary of the Chita CPSU obkom: "On the Approach to Udokan: Comprehensive Development of New Regions of the BAM-- A Wide Field of Activity for Komsomol Members and Young People"]

[Exerpts] The open-pit mines let them down. Or, more precisely, the "Lengiprotrans" [Leningrad State Planning and Surveying Institute of the Main Administration of Planning and Surveying Operations, USSR Ministry of Transport Construction], which designed these quarries, let the BAM workers down. It was discovered at the last moment that the Institute did not coordinate a single project with environmental protection elements. And where could the mechanized columns turn when some quarries were within an environmental protection zone, others were unfit because of the quality of the material and still others were too far from the route?

As usual, coordination was begun, a settlement, a search for variants. Now, on a whole, they have succeeded in settling the problems, but much time has been lost. Problems of this type are already being posed: to submit the highway alongside the route by the end of the year. Nevertheless, there is no assurance of this. The cause for the new possible delay is the variance in the working rhythms of the equipment operators and bridge builders. A collective from "Mostostroy-10" trust did not support the equipment operators' initiatives and is lagging very far behind the other BAM subdivisions. And who needs a highway without bridges? You can't drive over it...

The example of this type of approach to matters is, alas, very characteristic of Siberia. Uncoordination--how dangerous it is in an important matter. One lets them down and this shows up in the results of everyone's work. Commitments and deadlines are broken and state funds are being wasted. The Chita sector is the completion point for all construction. Here, the last, the "golden" spike will be driven. Chita will open through traffic over the second trans-Siberian railroad. And you unwittingly think that the most

impenetrable sections will become accessible because of the courage, the steadfastness, the strength of men. And sometimes the inertia, the elementary intransigence of some economists is simply incomprehensible.

Of course the Udokan copper deposits are of particular value. Its reserves are colossal, and the copper content in the ore is very high.

Natural conditions here are extreme: permafrost, high seismicity, harsh climate and high mountains. The policy to protect labor is the most correct, the most efficient course for developing the Siberian economy, particularly in the Eleventh Five-Year Plan.

There is still another difficulty--protection of the environment. The project institutes are proposing to supply the Udokan industrial center from a heat and electric power station operating on solid fuel. However the specific climatic conditions of the Chara Basin (where there are frequently observable stagnation phenomena in the atmosphere) are compelling them to search for other solutions. Otherwise the Udokantsy will not see their neighbor because of the dense smog blanket.

The particular natural conditions within which Udokan is situated require that much exploratory and scientific-research work be carried out. However, the data which have been accumulated by scientists do not yet permit us to begin drawing up a technical project for construction of an ore-dressing plant. The research is going on intolerably slowly.

Another feature in the development of the BAM zone is the fact that the mineral resources here are not deposited singly, but rather in groups. For example, the value of "by-product" components in the Udokan ore is no less than the value of the copper itself.

Comprehensive use of the mineral-raw material resources of the Trans-Baykal region is one of the burning problems of the oblast's economy. Its successful resolution may raise the entire economy of the region to a new level. However, it is being unsatisfactorily resolved at present.

Here is an example. In Chitinskaya Oblast, the Orlovskiy Ore-Dressing Plant is being constructed on the basis of the Orlovskoye rare-metals deposits and the Spokoyninskoye tungsten deposits. It is possible to create a waste-free production technology here. Everything may be put to use--the useful spars, mica, quartz. Add an inexpensive section onto the ore-dressing mill and get a mica concentrate. Rock from stripping operations is the material for producing high-grade crushed stone. The total for the realization of "by-products" types of raw materials may exceed realization of the basic products by a factor of 3! However, the USSR Ministry of Nonferrous Metallurgy is orientating itself to exploit just the basic metals.

It is impossible to develop the northern Trans-Baykal region without a developed road network. The problem of modernizing the Mogocha-Chara winter

road in order to increase the time it is open from 4-5 to 7-8 months per year should be considered as a task of prime importance. This would make it possible to expand preparatory work in developing the Udokan deposits more effectively before arrival of the BAM. But it is not clear who will head this modernization. Not a single department is yet undertaking to finance this measure, not the Ministry of Transport Construction, nor the Ministry of Nonferrous Metallurgy nor the RSFSR Ministry of Roads. Meanwhile everyone needs the road...

Still another extremely difficult question: who is to organize that huge amount of capital investments which will be required for construction of the complex? The subdivisions of Glavbamtroy (Main Administration for Construction of the Baykal-Amur Mainline--exact expansion unknown) is now expanding their equipment for construction of the railroad line. However, after a year or two, certain types of work will be cut back. In our view, it would be unwise to eliminate or to divert the resources of building subdivisions only to reestablish them for construction of the Udokan complex and city already within the system of another ministry. Obviously Glavbamtroy, USSR Ministry of Transport Construction is fully capable of becoming the general contracting organization for construction of the Udokan complex. For this work should be begun within the Eleventh Five-Year Plan.

A comprehensive intersectorial program and, more importantly, an intersectorial administration is necessary. Steps have already been taken toward setting up the program. In the "Sibir'" scientific program drawn up by the Siberian Branch of the USSR Academy of Sciences, a sub-program, "The Udokan Copper Ores," has been specially singled out. Everyone feels that it is good, but it does not have the power of law. Given such a situation, it is not worthwhile for departments to be forcing "their own" interests through everywhere.

The final decision has not yet been made concerning the following matter: is the Udokan territorial-production complex to be, or will the matter be restricted to just an ore-dressing combine? Judging from all appearances, the second variant seems more suitable to the Ministry of Nonferrous Metallurgy. But the interests of the country's national economy dictate that it is necessary to develop the Udokan ore in situ. Why? The computations are simple. Formation of the Udokan territorial-production complex will create the conditions for organization of large-scale chemical-metallurgical production in the Trans-Baykal region, with other valuable mineral resources being drawn in extensively.

From an oblast chiefly exporting mineral raw materials, the eastern Trans-Baykal region should be transformed into an oblast which processes this raw material. It is not difficult to convince oneself that when the question is posed in this manner, it is also most acceptable from the point of view of efficiency of the national economy overall. The Trans-Baykal region has a full allotment of mineral resources which permit the organization

of a number of major plants set up to cooperate among themselves. One must consider that, for practical purposes, providing the territorial-production combine with fuel and power will not require any kind of outside "subsidy." Output from the Kharanovskiy open-pit coal mine which is now in production may be brought up to 12-15 million tons per year. Development of the Apsatskoye, Tugnuyskoye, Tataurovskoye and other (hard) coal deposits will start in the near future. The Kharanovskaya GRES, an all-union Komsomol "shock" construction project, will produce power in the near future. The reserves of building materials, scarcely a quarter of which are presently being used, are immense. A genuine complex may be set up on such a base. Its advantages are apparent.

Participation in developing the natural riches of the zone must be seen as a direct, immediate continuation of the patronage of republics, krays and oblasts of construction of the BAM. Meanwhile, certain chiefs have already decreased their attention to construction. There isn't far to go for examples. Envoys from Kazakhstan and Uzbekistan are supposed to build settlements along the route in the Chita sector. However, the chiefs have limited themselves for now to installation of a 500-number ATS [Automated Telephone Station] in Chara.

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RAILROAD

COAL, OIL TRANSPORT PERFORMANCE

Early September

Moscow GUDOK in Russian 17 Sep 80 p 1

[Text] In the first days of the second 10-day period of September, rail workers cut back the tempo of coal shipment. For example, whereas they failed to provide miners with 747 cars on 11 September, on the 14th they failed to provide 2.5-fold more -- nearly 1,700 units of rolling stock. The Donetskaya Road alone failed to provide miners with 922 cars that day. The Northern Caucasus, Northern, Alma-Ata, Kemerovo and Transbaykal roads also failed to cope with their assignments. The technical plan was met by the Sverdlovsk, Krasnoyarsk, Moscow, Southeastern and Dnepr'. In the final days, the stability of the Virgin Lands Road was outstanding; it generally exceeds the assignment by a considerable margin.

The Eastern Siberia Road also deserves praise. This road is successfully shipping not only coal, but also petroleum products. Thus, on 11 September it loaded 37 tank cars above the plan, and on 14 September even more -- 104 tank cars.

In general, the petroleum products loading situation is somewhat better than the coal loading situation. Basically, the roads of the south and southwest are deserving of praise in this area, as they systematically overfulfill the plan. Unfortunately, the same cannot be said of the mainlines in eastern regions of the country.

And what about returning empties? It is hard to give a firm appraisal of the operation of particular roads: one day good, one day bad. For example, one large mainline returning empties, the L'vov, was unable to transfer the necessary number of gondola cars on 11 September, but on 14 September it covered the assignment and then some. That same day, the Belorussian, Moscow, Gor'kiy, Southwestern, Moldavian, Northern Caucasus, Alma-Ata, Central Asian and South Urals also overfulfilled that assignment. The latter returned nearly two-fold more empty gondola cars than the norm.

September Summary

Moscow GUDOK in Russian 4 Oct 80 p 1

[Text] In September, rail workers shipped considerably less coal than in August. Let's compare two figures: in August, the railroads were 3.5 million tons in debt to the assignment, and in September -- more than five million tons. And the state plan was underfulfilled by 2.2 million tons.

Of all the coal-shipping roads, only three coped with the assignment: Northern Caucasus, Moscow and Eastern Siberia. The Donetsk, Dnepr', Northern, L'vov, Odessa, Kuybyshev, Alma-Ata, Central Asian, Kemerovo, Transbaykal and Far Eastern roads failed to cope with either the assignment or the state plan.

One reason for the poor fuel shipment is the unsatisfactory provision of coal-shipping roads with empties. Not one of the mainlines except for the Transbaykal received empty gondola cars under empties-disposition orders in accordance with the assignment per day on average in September. This led to a situation in which the roads lacked cars to ship out coal and the daily assignments were not met.

The situation with regard to loading petroleum products was somewhat better. On many roads, the average daily indicator in September exceeded the plan. They include the Baltic, Belorussian, Moscow, Southwestern, Azerbaijan, Transcaucasus, Southeastern, Western Kazakhstan, Central Asian, South Urals, Krasnoyarsk and Far Eastern.

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RAILROAD

RETURNS OF EMPTY GRAIN CARS NEED IMPROVEMENT

Moscow GUDOK in Russian 11 Sep 80 p 1

[Excerpt] The demand for closed cars is growing as never before. Suffice it to say that for such roads as the Virgin Lands, South Urals, Northern Caucasus and Volga, where the main grain loading points are concentrated, the demand is for 1,500-1,700 covered cars daily. The October, Belorussian, Moldavian, Odessa and Donetsk roads are in critical need of this kind of rolling stock.

One serious shortcoming causing the critical deficit of closed cars on individual mainlines is the uneven distribution of this rolling stock by regions of the network. Thus, the working fleet has more than 16,000 cars above the norm on roads of the Urals, Siberia and the Far East. At the same time, there are not enough cars in the center and the south, although there are reserves within these zones. The fact is that the Northern Caucasus and Odessa roads are 4,000 empties below the norm, but the Transcaucasus, Azerbaijan and Southwestern are holding that many for themselves.

It is necessary to take effective steps to skillfully regulate the flow of all empties, directing it towards roads of the east, the center and the south. Traffic in closed cars must be steady and uninterrupted. In the operating technical norms for September, the ministry precisely determined the numbers of closed cars to be transferred by specifically distributing their movement by zone. But practice has been far from what was planned. The responsibility for an uninterrupted supply of empties to the Virgin Lands and individual zones of the Southern Urals rests fully and entirely on the Far Eastern, Transbaykal, Eastern Siberia, Krasnoyarsk, Central Asian and Western Siberia mainlines. They are obligated to supply empties and ensure that they move quickly to where the grain is being shipped out on a large scale. Leaders of the empties-disposition mainlines must answer for grain shipment equally as must the grain-loading roads, if not more so.

But what is happening with fulfillment of the empties-disposition assignment? Suffice it to say that the Far Eastern, Eastern Siberia, Central Asian, Moscow, Transcaucasus and Azerbaijan were about 9,000 empties in debt during the first 10-day period of September. And what of execution discipline? The conclusion must be that by no means all road chiefs consider it law. Take, for example, the Krasnoyarsk, led by Comrade Fadeyev. On 9 September, it was obligated to put through the entire flow of closed cars being sent to the grain mainlines. Instead, the road grabbed about 350 of other lines' closed cars for itself. Why? Who allowed it? It turns out that the Krasnoyarsk Road's workers themselves directed that it be done, although they could have increased unloading themselves and not loaded an extra 250 cars with freight of secondary importance without ministry instructions to do so.

RAILROAD

BRIEFS

NEW RAILROAD LINE--Tashkent, 29, (PRAVDA correspondent Yu. Makimov)--The first train arrived at Chimbay, a city at the junction of two deserts--the Kyzyl Kum and Kara Kum. "Barsa-Kelmes"--"You go--you don't come back " this is what they named the lifeless deserts on the shore of the Aral Sea. Running through the limitless Aral expanses is a railroad which links the republics of Central Asia with the center of the country. This steel branch line proceeds from Takhiatash via Amu-Dar'ya to Chimbay. [Text] [Moscow PRAVDA in Russian 1 Mar 80 p 6] 7962

RAILROAD CAR DEMURRAGE--The idle time of the rolling stock at the enterprises of the Ministry of Procurement RSFSR is this year equivalent to the losses entailed in the loading of more than 5,000 cars. This figure is especially significant now when the harvest is beginning. A number of enterprises of the ministry have not developed loading fronts; the mechanization of operations is inadequate; the transport shops are not being fully staffed with personnel; and the approach tracks of the grain-receiving points are poorly maintained. Because of this, the demurrage of railroad cars has increased for the Ryazanskaya oblast grain products administration alone to more than twice the norm. At the Denezhnikovskiy mixed fodder plant, in particular, this has resulted in idleness of the rolling stock for unloading in an amount which is seven times greater than the norm and is causing losses equivalent to the loading of 700 cars. Also operating poorly are the Sasovo grain-receiving enterprise, the Kaluga grain products combine, and a number of other collectives. The transport administration of the Ministry of Procurement and the administration of the Moscow Railroad should publicize the work of such advanced enterprises as the mill combine imeni Tsyurupa, mill combine No 4 in Moscow, and grain base No 36 in Orel; all of these are unloading cars at a high rate of speed.--I. Kokoulin, staff correspondent, Moscow. [Text] [Moscow GUDOK in Russian 10 Aug 80 p 1] 7962

MONORAIL CONVEYER--A monorail conveyer developed by the collective of the VNIlgorsel'mash [All-Union Scientific Research and Planning Institute of Mining and Agricultural Machinery] can transport freight weighing 200 kilograms at a speed up to 45 meters a minute. It is designed for operation in the citrus farm organizations. The first models of these conveyers were produced by the Georgian agricultural machinery plant Gruzsel'mash. This

innovation will make it possible to transport over rugged terrain the harvest material, fertilizers, and technical facilities for plantation maintenance. The collective of the enterprise has pledged itself by the beginning of the citrus harvesting season to deliver the first consignment of the monorail conveyers to the rural workers of the republic--G. Namtalashvili, staff correspondent, Moscow. [Text] [SOTSIALISTICHESKAYA INDUSTRIYA in Russian 12 Aug 80 p 2] 7962

D-56 DIESEL ENGINE--The diesel engine is the heart of the diesel locomotive. A new unit, the D-56, is now being developed at the Kolonna Diesel Engine Building Plant imeni V. Kuybyshev. An experimental shop is already producing a 6,000-h.p. diesel engine for final testing. The engine works evenly and confidently: all 12 cylinders reached their ratings quickly, but it is a long way from testing to series production. "Now we are checking the engine's specifications, noise and vibration levels and combustion temperature in each cylinder, supercharging pressure, excess air pressure, and so on," says diesel experimental shop foreman Yu. Voronkov. "The instrument readings 'tell' us what needs to be done to improve the operation of particular subassemblies. Brigades led by I. Yakutin and A. Dolmatov have recommended themselves well in the assembly and adjustment of the diesel." The diesel is being tested around the clock. The testers listen closely to the engine, look at its "cardiogram" and seek out new resolutions. Thus, at I. Yakutin's suggestion, the camshaft covers were sealed with special gaskets. Oil loss was reduced to a minimum and the diesel began working somewhat quieter. What diesel locomotives will be using the D-56 diesel engines? Chief Designer and USSR State Prize Winner A. Yermolayev answers: "Existing diesel designs cannot be increased to over 6,000 h.p. The fundamentally new design of the D-56 permits increasing power from 6,000 to 10,000 h.p. This was achieved, in particular, by increasing the number of cylinders. Moreover, the specific power of each cylinder can be increased from 500 to 600 h.p." It was decided to finish final testing on the D-56 diesel engine by the opening of the Party Congress. (N. Aleshkin) [Text] [Moscow GUDOK in Russian 30 Sep 80 p 2] 11052

SHCHEKINO CAR SHOP--Tula, 31 Aug--The car shop collective at the Shchekino Wood Processing Combine has met the five-year assignment ahead of schedule. It manufactures dormitory cars, dining cars and showers which can be delivered by truck or large helicopter to temporary sites. Such cars are adapted for use under harsh climatic conditions. Since the start of the five-year plan, Shchekino workers have manufactured upwards of 6,000 mobile homes on order from oil- and gas-field workers, geologists and transport workers beyond the Arctic Circle and in Siberia, builders on the Baykal-Amur Mainline, and construction workers at other projects. The enterprise has mastered the series production of improved all-metal dormitories and cultural-, personal-services facilities for use in the North. They are strong and durable and are more comfortable than previous units. (N. Makharinets) [Text] [Moscow PRAVDA in Russian 1 Sep 80 p 2] 11052

VKHODNAYA-IRTYSHSKAYA SECTOR OPEN--The flow of freight is increasing on the recently electrified Vkhodnaya-Irtyshskaya sector of the Omak-Rubtsovsk mainline. Trains nearly three times larger than several years ago now travel it and the weight of the consists has increased by approximately 500-700 tons. Electrification of the sector enabled the Omak locomotive depot collective to take on higher socialist obligations. In honor of the up-coming 26th CPSU Congress, they have decided to run at least 150 large trains and to haul at least 75,000 tons more national economic freight on them in the second half of the year. At the same time, they are intensifying the struggle to save electric power. Depot workers recorded in their new obligations: save 700,000 kW-hr of electric power and 220 tons of diesel fuel by using advanced train operating methods in the second half of the year. That is considerably higher than the initial goals. (E. Chernyshev) [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 19 Sep 80 p 1] 11052

PNEUMATIC CONVEYOR PIPE--(TASS)--Khar'kov specialists have developed an efficient automatic pneumatic conveyor. Its use will accelerate two-fold moving mineral fertilizers, soda, cement, schist and other bulk materials by pipe. They will reach the shops and warehouses of enterprises in closed rail cars and ship holds in an even flow. Working conditions will improve for servicing personnel, as dust will be eliminated from premises. We plan to equip enterprises of ore-enrichment, chemical and cement industry with these pneumatic conveyors. [Text] [Moscow GUDOK in Russian 17 Sep 80 p 4] 11052

BAM TUNNEL--The "Bamtonnel'stroy" collective has resolved to finish drilling the 6.7-km Baykal Tunnel ahead of schedule, by the opening of the 26th CPSU Congress. (A. Kleva, Nizhneangarsk) [Excerpt] [Moscow NEDELYA in Russian No 31, 1980 p 5] 11052

CSO: 1829

MEANS OF DEVELOPING WESTERN SIBERIA'S RIVER TRANSPORT

Moscow TRUD in Russian 14 Aug 80 p 2

[Article by P. Drachev, candidate of economic sciences and chief of the Tomsk river port: "Year Round Navigation; Concerning Means of Developing River Transportation in Western Siberia"]

[Text] In Western Siberia, the territorial-production complex of river transport is one of the fastest growing. Its transport volume grew in 1980 to 55 million tons with a cargo turnover of 33 billion ton-kilometers. However, there is a substantial gap between the demands of the national economy and the resources of the rivermen. One of the main reasons is the inadequate use of the fleet, the great idleness during loading and unloading. As analysis shows, the capacity of the piers, especially at northern points, falls sharply behind the resources of the fleet. In 1979, its over-plan idleness amounted to as much time as would have permitted the transport of 2 million tons of national economic cargoes.

Mechanized piers were not constructed in timely fashion in the regions of the development of petroleum extraction. A continued growth of the fleet will no longer be able to provide the necessary increase of transport volume if the USSR enterprises located in Western Siberia: Minnefteprom, Minneftegazstroy, Minenergo, Ministroy, and Minlesprom [Ministries of (respectively) the Petroleum Industry, the Construction of Petroleum and Gas Industry Enterprises, Power and Electrification, Construction, and the Timber and Wood Processing Industry] do not take the most energetic steps to construct mechanized piers in the North.

The correct solution of the transport problem for the immense territories of the North, Siberia, and the Far East is possible only on the basis of the fullest use of scientific and technical progress in transport, especially the development of new kinds of mobile equipment.

The creation of a well managed network of railroads and macadam highways requires a capital investment of many billions. Hence, that solution of the transportation problem for these vast regions, in its classical sense, is moved into the extremely remote future. But the steadily growing demands of the national economy of the country for raw materials obligate us to accelerate the introduction of transportation into the

indicated territories where there are concentrations of enormous, and, in some cases, unique resources of useful minerals. Proceeding from the conditions being created, as the solution to the problem of transport development in the northern regions of Western Siberia, we see a new-in-principle approach to the planning and distribution of capital investments between the two main parts of the material and technical foundation of transport - between the mobile equipment and the construction of a route.

The principal portion of the capital investments, in our opinion, should be made in those forms of mobile equipment which do not require large preliminary route preparations. This, in the first place, is transport on an air cushion, able with equal success to move along rivers, lakes, ice, snow, concrete or any other smooth supporting surface. The organization of year-round use of ships on an air cushion (SVP) [hovercraft] of course, has a very significant effect.

In the 1960s several experimental ships of this type were built in the USSR. One of them, the experimental passenger ship "Sormovich", is amphibious with a nozzle arrangement for the formation of the air cushion and a flexible air cushion enclosure. Tests showed that despite a number of deficiencies, "Sormovich" with equal success could go over ice or water; that is to say, it could operate year-round. Its speed over ice reached 95 kilometers per hour. In the past year, a non-self-propelled platform on an air cushion, PVP-40, was tested and showed good results. Consequently, right now, these ships can be used confidently in the fleet, and can be included in a unified transport system for Western Siberia to provide reliable communication with the regions of new development.

As is known, seasonal transport raises the necessity of creating large stores of cargo in warehouses. The SVP permits ending this ineffective practice. Hovercraft will permit use of the small rivers in the Ob'-Irtys' basin. This will provide the growth of the volume of river transport without increasing the lengths of the routes with guaranteed depths and without using icebreakers to prolong navigation. The river fleet will become more economical in comparison with other forms of transportation, especially in the north part of the Western Siberian region, where there are a huge number of small rivers. And, if it is taken into account that river transport in Western Siberia, on a number of routes, is the only form of communication, then the use of small rivers is one of the main problems.

Amphibious SVP, having unusual all-terrain qualities, will provide uninterrupted passenger and cargo transportation. The speed of delivery of valuable cargos on SVP developing traveling speeds up to 100 kilometers per hour or more, will grow in comparison with motor transport in the given conditions, by 3 to 4 times.

In year-round operation of amphibious SVPs, the adjusted expenditures amount to 8 or 9 kopeks per ton-kilometer, and in the transport of cargoes in these regions by winter roads, it is above 30 kopeks. On the line from

Urengoy to Tazovskoye, with a cargo turnover on that segment of 105 million ton-kilometers, by use of SVP, the annual saving in adjusted expenditures amounts to 21 million rubles (relative to transport by winter roads). It should also be noted that with SVP, the productivity of labor in loading and unloading is raised by a factor of 4 because this fleet can go "from-door-to-door".

Specific attention must be given to the organization of the transport of passengers and cargoes on SVP in a service from river to sea to river. Investigation showed the advisability of using the present fleet for inshore navigation and reaffirmed its operational and practical necessity. The Ob' - Irtysh basin with the sea coast (the Ob'skaya, Tazovskaya, Baydarskaya, and Gydanskaya Inlets from the Kara Sea) are ideal routes for hovercraft.

The problem of the transport of passengers and cargo by hovercraft is technically solvable. In our opinion, the question about the creation in the USSR State Committee for Science and Technology of a special subcommittee on transportation responsible for the development and introduction of new mobile equipment (hovercraft, dirigibles, towed balloons, termoplany [self-propelled hot-air balloons?]) has become ripe. This new equipment is urgently needed in the region of Siberia and the Far East.

There are also other resources for raising the effectiveness of the operations of river transport. The rapid opening up of small rivers today has become a necessity. But, for rivermen, operation on small rivers is unprofitable because the fleet being used has small cargo capacity. The more the rivermen deliver cargoes to points located in small rivers, the more complicated to them is the fulfillment of plan assignments in the growth of labor productivity and in reducing the cost of transport.

In our opinion, it is necessary to introduce a coefficient of labor intensiveness according to which the economic indicators for small rivers could be recomputed. This also should be taken into account in the determination of standards for recognition and material incentive awards.

Practice shows that within the boundaries of a single river system, there must be one boss. Now, the Ob' basin is served by three independent enterprises: the Upper Irtysh, the Irtysh, and the West Irtysh shipping companies. It is characteristic that the cost of transportation in the West Irtysh shipping company, for example, is 70% lower, but the productivity of labor is 65% higher than in the Upper Irtysh company. Reasons are being introduced for uniting these three adjacent enterprises. Then the empty running of kazakhstani ships for Tomsk timber and the unreasonable transport of gravel from Tomsk to Omsk and so on will be discontinued.

The departmental fleet operates especially unproductively. And this is not a small force. In Western Siberia alone, it numbers more than 3 thousand ships. But the cost of transporting cargoes by these motorships is 10 times higher than in the Ministry of the River Fleet system.

There is still a problem. Up to now, our main indicator of operations is cargo turnover in ton-kilometers. At the present stage this indicator clearly does not respond to the spirit of the times. The rule for the activity of any transportation must be the delivery of cargoes to the receiver in tons according to designation and along the routes in the least time with least cost. In the North this is especially important. Apparently it is advisable to introduce supplementary coefficients into the operative system of tariffs. Suppose the carrying charge is increased or decreased depending on adherence to the scheduled delivery of cargoes. This will permit raising the economic efficiency of fleet operations, and materially will encourage transport workers to deliver cargoes on time or early.

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CSO: 1829

OCEAN AND RIVER

CAPTAINSHIP TRAINING OUTLINED

Moscow KOMSOMOL'SKAYA PRAVDA in Russian 22 Aug 80 p 4

[From an interview with P. A. Nechayev, deputy chief of the Administration of Educational Institutions of the Ministry of the Maritime Fleet]

[Excerpts] [Question] "Pavel Aleksandrovich, how does one become a captain?"

[Answer] "The best way is to enter one of the educational institutions of the maritime fleet."

"I simply want to emphasize that a modern seaman must be a literate, erudite and highly qualified specialist."

"Engineers and ship operators are trained at the higher marine engineer and deck officers' colleges. In the period of studies, the trainee goes through practical work. On training ships they acquire knowledge for their future profession. Graduates of the deck officers' faculty, after obtaining 6-7 years of conscientious work, they become senior assistant captains. Work in this position gives the right to receive the diploma of a sea captain."

[Question] "Pavel Aleksandrovich, youngsters wish to know where the industry's higher educational institutions are."

[Answer] The Ministry of the Maritime Fleet has the Institute of Engineers of the Maritime Fleet in Odessa, and also four marine engineer and deck officers' colleges in Leningrad, Odessa, Novorossiysk and Vladivostok."

[Question] "Then a higher maritime education can be obtained only in these cities?"

[Answer] "No, and here's why. At the basic higher educational institutions there are correspondence and evening faculties and departments. To facilitate the training of corresponding students, student counseling points and correspondent faculties and branches have been created at

several ports. These are at the ports of Nakhodka and Kholmsk, in Arkhangel'sk, Murmansk, Izmail and Zhdanov."

"We also have the training fleet. Twelve student training ships are used for the practical work of the trainees. Real schools for courage are the trainees' cruises on the sailing training ship "Tovarishch" which twice has come out absolute victor in international sailing regattas."

"Students of the higher marine engineer and deck officers' colleges, the nautical colleges, and also the nautical schools are fully supported by the state. Free of charge they are given housing, prescribed clothing, food, and, in addition, a stipend. I emphasize that graduates of our educational institutions are healthy, strong, courageous and educated people."

[Question] "Many school graduates are interested in knowing 'Can a girl work in the fleet?'"

[Answer] "The Odessa Institute of Engineers of the Maritime Fleet accepts girls. For work at sea, especially on passenger ships, cooks, confectioners, and waitresses are needed. They are trained at the Leningrad PTU-41 [Professional and Technical School 41] and the Odessa PTU-1.

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CSO: 1829

OCEAN AND RIVER

WEST GERMANS VIEW CAPABILITIES OF SOVIET MERCHANT FLEET

Bonn TRUPPENPRAXIS in German No 6, 1980 pp 505-512

[Text] The author is well known to the readers of TRUPPENPRAXIS through his articles about the merchant fleet. His article is based essentially on the introduction to his documentation entitled: "The CEMA Problem in Line Navigation," published by Broecker-Verlag, Hamburg, and introduces a very serious problem which shipowners in the Western World must cope with on a daily basis.

The German-Soviet shipping talks, which took place in Hamburg and Luebeck 29-31 October 1979, brought no progress in the solution to the central problems. Even the overall results of the 3-day consultation are so minor that the mere fact that the talks took place at all is considered to be a success.

The Soviets again made no concessions regarding certain limitations in cross trade (dealings with third nations). When it comes to this main problem, they adhere strictly to their own point of view. No change of attitude can probably be expected in the future in this area either. The German delegation, to be sure, noted with some satisfaction that the Soviet participation in the North Atlantic lines had recently been reduced somewhat, but they had noted with "great concern" the sudden increase in Soviet participation in sea traffic between the West Coast of Central America and the FRG in the past 3 years, as well as the still very strong competition in the East Africa traffic.

The situation in the Far East sea traffic was also viewed as increasingly critical. The trans-Siberian railroad transports have an especially negative effect on the sea traffic, which in addition faces competition with a strong Soviet merchant fleet. According to the FRG's Ministry of Transport, the German delegation has expressly urged "the Soviet representatives to contribute to the solution of these problems." Prospects for the future become even darker once the extraordinarily large capacity of the new Baikal-Amur-Magistrals (BAM) is available for container transport, which should be in the foreseeable future.

Independent of carrier and route, the German side views the traffic between the FRG and the Far East in an economic light. For that reason it considers joint consultations regarding future development and a possibly joint agreement on sea traffic and trans-Siberian container traffic necessary. The Soviet side, on the other hand, insists on a separation of land bridge and sea route. It was noted with satisfaction at the end of the consultations that the sea traffic between the FRG and the Soviet Union, based on equal rights, continues to the satisfaction of both sides. In addition, an increased use of German tonnage by Soviet charterers in bulk-goods commerce between the Soviet Union and third countries has been registered.

Also welcomed was the fact that the India/Pakistan shipping conference was joined by the appropriate Soviet line, as well as the fact that the Soviet Union last June registered with the United Nations a ratification document to its code for navigation conferences.

The German merchant marine is drawing the conclusion that overall, "the negotiations have helped make it clear to the Soviet representatives that there are necessary limits to their activities." Now it is up to the Soviet government and the Soviet merchant fleet to give indications until the next round of negotiations in the summer of 1980 in the USSR, that the German arguments have been understood.

However, it must be noted realistically that nothing came out of the negotiations for the German side. The Soviets, on the other hand, have once again won a year's time until the next talks in the fall of 1980: that is their success. That, which is called positive in the weak German position, has in reality little significance: So what if the Soviet participation in the North Atlantic has been reduced a little lately? Compared to our total volume, it is still much too great and Soviet tonnage can be expanded at any time as long as there is no negotiated agreement. Direct commerce between the FRG and the USSR was also a point of great satisfaction. But it had never been a special problem, and had been noted as early as the round of talks held before the last one.

Or can experts be impressed by the increased use of German tonnage in the bulk-goods commerce between the USSR and third countries, because the bulk-goods market is a free market which goes by offer and demand, and the situation could change overnight. Besides, the Soviet Union must depend on accepting foreign tonnage because of its continued large grain imports, because it does not--as yet--have a sufficient amount of its own bulk tonnage.

Registering the ratification document to the code is no more a result of German-Soviet talks than is the fact that the Russians participated in the India/Pakistan conference. Adhering to the code is part of global Soviet policy, to give the impression of being open, especially to the concerns of the third world, and joining the conference is clearly a bait for the

developing Indian giant, which has been courted politically for a long time and which, with its relatively well-developed merchant marine, surely would not have put up for very long with the Soviet attitude, at least not when it concerned Indian interests.

The Soviet problem in the merchant fleet remains unchanged. One must look at the details and at the system in order to be able to recognize the dangers. The following explanations will help. But first, two quotes:

Rismarck wrote regarding German-Russian relations of July 1888: "...If we want to live in friendship with the Russians, we must give them the impression that we can exist without them, that we do not need them and do not fear them, that we want nothing from them and that we feel we can handle any possible situation without them."

Adm Sergey G. Gorchkov writes in his book "Seapower Soviet Union," which was published in 1978 by Hoffman and Campe, Hamburg, in German translation: "A nation's seapower can rightly be considered a system, characteristic of which are not only the ties between its individual components (war fleet, merchant fleet, fishing fleet, research fleet, etc.), but also a relationship with the environment--the ocean.... All these components, which form the total merchant fleet complex as a branch of the people's economy and as a part of the seapower of the Soviet Union, are to be developed further in the future, too."

Prehistory

Turning Point--Cuba Crisis

It is generally known in interested circles that a fundamental change occurred in Soviet naval policy after the touchy, prestige-costing defeat in the 1962 Cuba crisis. What had been a land power, now put great and surprising efforts, both qualitative and quantitative, into building up its navy, and began competing with what had been the world's No 1 seapower, the United States. Nothing more need be said here about its present status and future perspective.

The present "Red Fleet" has been designed and formed by Admiral Gorchkov, an unusually capable thinker and planner who has become a legend in his own lifetime, who not only saw in his country's naval power the "shining defense," but also recognized the fact that a seapower consists of numerous components. What he means by that has been said at the beginning of this article. So, barely noticed and evaluated by the West for more than a decade, the Russians built, in addition to their spectacular fleet, an equally large and efficient merchant marine. Both of them serve one purpose only.

At the present time the Soviet Union owns by far the largest research and fishing fleet in the world. To be able to comprehend its relative size, let us assume that Soviet research ships make up more than 50 percent of the world's tonnage and that the Soviet fishing fleet by itself is as large

as the next 10 fleets together, ranked according to size. No member of the navy need be told that the numerous Soviet fishing vessels distributed all over the world do not serve for fishing purposes alone. Everyone has probably at least once been in contact with a "trawler" which was heavily equipped with electronics.

The USSR's fleet of passenger ships is also among the largest in the world. It has been able to increase its tonnage considerably in recent years, in part by buying relatively new "secondhand ships" from the West. The formerly German "Hamburg"/"Hanseatic" and the present "Maxim Gorki" are examples of this. The ships are employed largely on Western markets. Even if this sounds exaggerated, potential troop transporters are this way kept in readiness while bringing profits.

In addition, Moscow manages--and this is decisive--the world's largest piece-goods freighter fleet. Now we have reached the theme of this paper. The Kremlin was able to expand its merchant fleet to such an extent that it moved from 14th position in the world in 1960 with 3.4 million BRT to 6th position in 1978 with 22.3 million, without, however, increasing its exports on sea correspondingly. This places it, e.g., considerably ahead of the American merchant fleet which is in eighth place with 16.2 million BRT.

For the past 5 years approximately, the problem of the steadily expanding Soviet merchant fleet has been recognized, at first in shipowner circles, and the resulting dangers have been pointed out again and again. The ship-owners, who see the entire thing primarily from the economic point of view, have gradually gained support from the military, which is beginning to recognize the security aspect. Politically, the West has limited itself more or less to verbal support.

Establishment of Soviet Navigation Policy

It is no coincidence that the Soviet Union assigns such a priority to the expansion of its line fleet in pursuing its long-range goals, and only this aspect is the subject of Western criticism, i.e., of the apprehensions voiced. This must be clearly emphasized, because in their replies, Moscow tacticians always lump everything together (line shipping, bulk shipping, tank shipping, etc.) in order to reach a result more favorable to them in terms of percentage data. The reader or listener who is not familiar with the facts can easily be deceived about the real truth with this old and proven trick. Not everyone knows at once, e.g., regarding the total loading capacity that this must be seen differentiated, because the line capacity cannot be compared to bulk shipping.

The book "Fundamentals of the Economy of Sea Transport" which appeared in 1974 in the GDR, indicates that the merchant fleet has four definite functions: transport, political, economic and military. Looking at these functions alone, it is easy to determine that the problem of the Soviet merchant

fleet, seen in its totality, goes far beyond the actual shipping circles and must receive basic consideration under economic as well as security political aspects.

At stake for Western navigation is its existence, i.e., whether it can continue as private enterprise in the future. Because the Soviet Union, in order to be able to reach its goals, is in rigorous competition on line routes. Western navigation is to be weakened and eliminated as much as possible.

The reason why the ambitious expansion of the Soviet merchant fleet has not been properly recognized, i.e., interpreted, for such a long time is that, seen in its totality, its percentage participation in the world merchant fleet has remained relatively low in view of the enormous increase in Western fleet tonnage, especially their addition of large tankers and bulk carriers. But from the very beginning, the Soviets have expanded their line shipping, which, measured in tonnage, was not as noticeable in the statistics. They have recognized clearly that the efficient fine net of line service is the basis, i.e., the nerve center of commercial trade between the highly industrialized Western states. To penetrate this is interesting economically while at the same time hitting a very sensitive spot within the Western system. Later, the political lever could be applied most effectively here, once the Western economy had become dependent on Eastern carriers. Let us once again explain the purpose of line traffic, which serves certain ports in certain areas according to a definite schedule. As a rule, this schedule is adhered to regardless of whether the ships are fully or only partially loaded. This is especially true for modern transport systems in which the ship is only one link in the continuous transport chain. This makes it possible for exports, especially respective national exports, to include sea transport in its long-range calculations, which is important for storage and furnishing of materials. Most important are of course transport costs, because freight tariffs are determined at the line conference responsible for the respective area. This prevents detrimental competition, which no shipping company could afford because of the investments necessary to start up a line service. But competition is not eliminated in the conferences, as is sometimes claimed.

The fixed rates, on the other hand, permit shipping companies to make longer-range plans. But whether they in fact break even or bring profits is another matter and depends on many things which are, however, not to be discussed here. It is certain that Western shipowners doing business strictly from an economic point of view are not able to maintain a line service, if they operate permanently, or for a long period of time, in the red. Healthy shipping companies are of course able to cope with fluctuations, whatever the reasons for them may be, or certain rate wars. But they are not the norm, the field has become much too complicated and sensitive for it.

In order to reach their target, which is to obtain the highest share of cross trade possible in as many parts of the world as possible, Soviet shipping managers show an amazing flexibility. Free of any ideological ballast, they profit from the free-market economy in the West, which grants them access to every port and allows them to establish their own agencies and to acquire cargo everywhere in the West. As a result they buy, in addition, on the FOB basis and sell CIF, so that they always have the choice of vessel for the sea transport open. (FOB = Free on Board, agreements whereby the seller bears the costs and responsibility for the cargo only until it is loaded onto the transport vehicle of the buyer; CIF condition = cost, insurance, freight, is an agreement whereby the seller bears the discharge costs in the port of destination, insurance costs and freight.) If at all possible, of course, they take their own freighters, just as they leave the Eastern bloc markets and the Eastern bloc ports mostly closed to Western shipowners. It has always been a communist principle to negotiate only about the property of the other party, if possible.

Wherever they compete with Western enterprises, Soviet shipowners can operate on a different basis: the cost structures of their shipping companies can in no way be measured according to western standards. Charter costs, bunker prices, insurance costs and investments, only to name a few essential points, are not of the same importance to them as they are in the West, or are not important at all. What is decisive is that they are never faced with the risk of bankruptcy. This makes it possible for them to offer dumping rates anytime they choose, up to 50 percent below conference rate, and to maintain this offer as long as they choose.

The fact that there is no risk of bankruptcy enables the Soviets also to navigate in areas where they consider it to be politically advantageous, since shipping, just like everything else, is an intrinsic part of the total system. One look at the emphasis in Soviet shipping activities shows possibilities, intentions and practices.

East Africa

The Soviet Union asserts again and again that their shipping activities center around the requirements of their own export. Especially their East African traffic, however, is the most striking example that these assertions are false. The Soviet Besta Line offers three departures per month from West German ports to East Africa, while the German Africa lines limit themselves to one departure per month. The Soviets have succeeded in obtaining a considerable amount of German cargo through speculated underbidding.

The FRG is among the largest trade partners of almost all East African countries, Soviet trade, on the other hand, is almost nonexistent. They are concerned about communication with their black African satellite states Mozambique and Angola, about showing their flag as often as possible in the almost all more or less politically unstable neighboring countries there.

It is important to gain influence there also, and showing the flag has often in the past been the first step. The direction is clear, it is unambiguously pointing to South Africa.

Central American West Coast

Within 2 years the Soviets have succeeded, through drastic underbidding in gaining the largest part of cotton shipping as well as other valuable piece cargo. The German national line in this area, the Hapag-Lloyd Corp, which has been operating there for more than 80 years, suffered considerable losses because of these activities. The Soviet Balt Pacific Line had begun with monthly departures in 1977 and had doubled that in 1978. The result: the Soviet share in 1978 exceeded Hapag-Lloyd's in incoming traffic by approximately 70 percent, quantitatively.

Key point of Soviet shipping activities in this area is Cuba, which is being well supplied with civilian and military goods. So that the vessels do not have to return home empty, they are filled with "normal" line cargo for the north continent ports. Moscow strategists are thus hitting three birds with one stone: 1) The satellite Cuba is supplied (which must be done in any case); 2) The supply ships earn profits with Western cargo on their return trip home; 3) Western shipping is harmed considerably.

East Asia

The Soviets attack the rich East Asian commerce, the most important route for West European traffic after the North Atlantic, from two sides at once. For one, with the very potent Odessa Ocean Line, and secondly, by land with the trans-Siberian railroad, the Trans-Siberian Container Line (TSCL). The TSCL has in the meantime become the main carrier. The Soviets succeeded in beating the German market share in this area in the outgoing traffic (1978) by 39 percent and in the returning traffic by 45 percent. In 1978, the TSCL alone carried more cargo than Hapag-Lloyd, the German line operating in this area. During the first 6 months of 1979, TSCL increased its business by 25-30 percent over the previous year in traffic from and to Japan, by 35, i.e., 56 percent [of all traffic] in traffic from and to Hongkong, and by 92 percent in traffic from Korea (time span January to August). The Odessa Ocean Line employs in its Far East service approximately 18 to 20 ships, which it fills 25 to 50 percent through underbidding. The TSCL's underbidding amounts to 10 to 50 percent.

The reasons for the Soviet engagement are in the political and economic importance of the Far Eastern region. This need not be explained further. Another aspect is the use of the Trans-Siberian Railroads, which had originally been built for military purposes, for the container traffic. As long as it is used only for peaceful purposes, it can this way be offered advantageously to the West.

Wherever the Soviets have engaged in navigation or have expanded their engagement, their efforts have been successful within the shortest period of time. But their breathtaking success is not amazing if one considers that the entire centralized state apparatus, which does anything necessary to reach the set goal, backs the merchant fleet.

Not only does the quantity of the Soviet fleet expansion cause increased concern in western shipping circles, so does the quality of the added tonnage. The number of special ships--container ships, Ro/Ro ships, freighters for heavy cargo, among others--is increasing steadily. It is a striking fact that the Soviets place emphasis on the Ro/Ro system. This is probably no coincidence, because these ships are easily deployable for military purposes. With these high-grade special ships the West's technological advantage is either reduced or eliminated. Thus, this equalizing factor in competition, which until a few years ago had been significant, has also lost some importance.

It must, however, be mentioned that the West has aided this development by giving important know-how to the East. As an example, there is the American Lykes Lines, which sold their barge carrier plans (Seabee system) to the Soviets--with their government's approval, by the way.

It is clear that most newly constructed ships must seek employment in Western traffic. Soviet export by sea has not been expanded anywhere near to the degree to which their fleet has expanded. Soviet participation in cross trade continues to receive high priority, thus marking a further intensification of the conflict, which has shipping-economic and security-political implications.

The security policy is not only involved because the Soviets are invading and seeking to weaken a part of our economic system, but also quite concretely for military-strategic reasons. Admiral Gorschkov himself has said that the merchant fleet is a part of the Soviet seapower, of its military power. This need not be proved further. All that must be done now is to point out what the fast Ro/Ro and container ships, the modern cargo freighters, the barge carriers and heavy cargo transporters are able to do militarily. It is easy to calculate.

It is no coincidence that civilian and military crews of Soviet seapower are exchanged as a matter of course. This assures the coordination between the components. It has meanwhile become clear after long-range observations that the Soviet Union maintains regular fleet depots on a worldwide basis. For example, ships have suddenly "disappeared" for 1, 2 and sometimes even 3 months, not only in Soviet waters, but also in Vietnam, Lagos and Cuba. Since all of them have involved oversea tonnage, the reason could not have been an interim coastal engagement. It must be assumed that this tonnage was stored in waiting areas in order to be available on a worldwide basis, should it become necessary.

The patience of indifference with which Western labor unions are watching this development is amazing, if not suspect. Although they react very clearly in Western solidarity on many other occasions, and although they otherwise work vociferously for the creation and preservation of jobs, they permit Soviet ships by dumping prices to drive the Western shipping industry into a competition which seeks to eliminate the competitor, a competition which it cannot win in the long run. Jobs are lost every time a Western ship is driven out because there is not enough cargo. This leaves its mark also on the land organization, not only at sea. The possibility for the creation of new jobs is foiled with every ship which shipping companies are not able to build in spite of an increase in cargo. The fact that the labor unions show no concern about this cannot be justified.

It is high time to recognize what is happening with the Soviet merchant fleet in all its implications, and finally to show some reaction to it. Part of this is calling things by their proper names, because otherwise it will be understood even less. Today it is generally unpopular to accuse the Soviet Union of aggressiveness, no matter what happens. But what else should one call their practices in navigation? Even if their rigorous price underbidding in line navigation does not justify the word aggressiveness, another example can be given: approximately 2 years ago, the oil-producing nations were urged in an article appearing in PRAVDA to force the expansion of their tanker fleet in order to be able to control the means of transportation for their oil. The article said further that the OPEC countries must continue the intensive expansion of their tanker tonnage, since the "imperialist oil cartel"--although it had lost its leading position in controlling storage and production sites--is still in control of transport as well as processing and marketing. As stated in PRAVDA, although OPEC countries produce 90 percent of crude oil exports, they only own 2 percent of the tanker tonnage transporting that crude oil exports, they only own 2 percent of the tanker tonnage transporting that crude oil. The article stated further that the socialist countries are prepared to give substantial aid in the restoration of ports, in the purchase of seaworthy ships and in the training of "national cadres" for the fleets of the OPEC countries.

Is it necessary to be even more direct? The Soviets have recognized clearly how important it is to control the means of transportation, and pursue this goal consistently. But does the West know what it means to become dependent of the Soviets in this sector? That is doubtful, at least for wide circles within the economy who use Soviet ships for the transport of their import and export goods, and for wide circles in politics who are reluctant to touch on things which might give them the reputation of being an enemy of detente or in favor of the cold war, or because they have not interpreted the development correctly, i.e., are still counting on it to regulate itself.

The latter is only welcome to strategists on the other side. They "prove" again and again that they want to talk and negotiate about matters. But

politics should stay out of it and leave the making of regulations up to talks among experts, they say. This is unfortunately still taken to be a sign of readiness to cooperate. This way the solution to the problem can be postponed more and more. In the West, because it means one does not have to take concrete measures, in the East, because one gains time this way, and can create--in a proven manner--facts which ultimately become part of reality.

Who are these "experts?" The Soviet experts are representatives of the state. Behind them stands the aggregate power of the entire apparatus, for which navigation is merely a means to an end. The Western experts, on the other hand, only represent private enterprises who can only operate with numbers and arguments, but without any real power.

USSR Merchant Fleet Development 1960-1978

(Vessels of 100 grt and over)

Jan 1st	No.	grt	dwt (long tons)	dwt Index 1960 = 100	Average size dwt
a) Dry Cargo Fleet					
1960	893	2835700	3927657	100.00	4398
1965	1175	4493004	6072061	154.60	5167
1970	1722	7363729	9668086	246.20	5614
1971	1812	7831967	10196430	259.20	5627
1972	1882	8120870	10548991	268.60	5605
1973	1944	8302391	10716328	272.84	5513
1974	2025	8821206	11444626	291.39	5652
1975	2114	9525378	12320248	313.68	5828
1976	2185	9944085	12811636	326.19	5863
b) Tanker Fleet					
1960	140	700163	975104	100.00	6965
1965	233	2039968	2899872	297.40	12445
1970	381	3465891	4891710	501.70	12839
1971	428	3764639	5300902	543.60	12385
1972	460	3903404	5496638	563.70	11949
1973	477	3952424	5572621	571.49	11683
1974	485	3952946	5604081	574.72	11555
1975	487	3989761	5747446	589.42	11802
1976	493	4051024	5851665	600.11	11870
c) Total Dry Cargo and Tanker Fleet					
1960	1033	3535863	4902761	100.00	4746
1965	1408	6532970	8971933	183.00	6372
1966	1510	7454680	10259893	209.30	6794
1967	1614	8086488	11169303	227.80	6920
1968	1790	9065123	12373764	252.40	6912
1969	1894	9592251	12843680	264.00	6834
1970	2103	10829620	14559796	297.00	6923
1971	2240	11596606	15497332	316.10	6918
1972	2342	12024274	16045629	327.30	6851
1973	2421	12254815	16288949	332.24	6728
1974	2510	12774152	17049707	347.76	6793
1975	2601	13515139	18067694	368.52	6946
1976	2678	13995109	18663301	380.67	6969

Source: Institute of Shipping Economics, Bremen

Additional Large Ro/Ro Ships for the Soviet Union



At present, two additional large Ro/Ro ships of the "Magnitogorsk"/"Komsomolsk" class with 22,000 tons dw are being built in Finland. The loading ramps are almost 6 km long. It is no coincidence that the Soviets are especially increasing this class of ships.

PHOTO CAPTIONS

1. P 505. The Ro/Ro ship "Skulptor Vuchetich" belongs with 17,499 tdw to the largest ships of this type. It reaches a speed of 20.5 knots.
2. P 508. The majority of Soviet passenger ships bring hard cash into Western markets. Here the "Estonia" (4,871 BRT) and the "Aleksandr Pushkin" (19,861 BRT) in Bremerhafen.
3. P 509. The Ro/Ro ship "Inzhenier Bashkirov," built in Finland in 1975, has a speed of approximately 17 knots. The ship, which carries 6,128 tdw, can transport 171 containers, 46 trailers and 287 Pkw.
4. P 511. The cargo freighter "Josif Kubrovinski" built in Stettin in 1973 can carry 7,400 tdw and reaches a speed of almost 16 knots.
5. P 512. The plans for this barge-carrier type which, like many other excellent special ships, was built in Finland, were bought by Americans. The "Tibor Szamuely" is the second ship in the series. It is able to carry 37,850 tdw, and can transport 26 large lighters of 1,070 tdw each. It has a speed of 20 knots.

9328
CSO: 1826

OCEAN AND RIVER

NEW HYDROFOIL 'KOLKHIDA' DIFFERS FROM ITS PREDECESSOR

Tbilisi ZARYA VOSTOKA in Russian 24 Jul 80 p 1

[From article by O. Khukhuni, secretary of the Party Committee of the Poti Ship Repair Plant imeni S. Ordzhonikidze, entitled: "Kolkhida" - A New Generation of Hydrofoils".]

[Excerpts] The model of the new ship differs in many respects from its predecessor, the "Kometa" class. "Kolkhida" reaches a speed of 35 knots. In the cozy and comfortable air-conditioned saloons, 140 passengers can be seated. High seafaring qualities permit the motorship to go to sea even in three-meter-high waves.

The Gor'kiy Central Design Bureau for Hydrofoil Craft together with specialists of the plant developed the design of "Kolkhida". Initially, completion of the design was scheduled for 1982; however, the personnel of the plant, in the past year, proposed to the designers that joint measures be taken to accelerate the development of the design. This has succeeded very well. Today, work at the plant on building the ship is going ahead at full speed.

Already, for example, production equipment, developed by plant production engineers, is being manufactured. In the ship fitters' shop, metal panels, on which the assembly and welding of the transverse frames will be carried out, are already finished. The preparation of the assembly slip - the areas under the new ship - is going forward.

A month ago, in a solemn ceremony at the plant, the first part of the new ship was made.

Today at the plant, the front of operations for building the new vessel becomes ever wider. Ever larger teams of workers participate in the assembly of parts

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OCEAN AND RIVER

BRIEFS

SHIP ENROUTE TO VIETNAM--The "MV Kommunist" is on its way to Vietnam with 11,000 tons of industrial cargo, and the dry-cargo vessel "Georgiy Chicherin," which was recently in Danang, has now arrived in Bordeaux. [LD030128 Moscow Domestic Service in Russian 2200 GMT 30 Sep 80 LD]

NEW TRAWLER--A new trawler, the "BMRI Georoi Sharonintsy," has left the Nikolayev shipyard on its first voyage. The designer of the trawler says the ship is over 100 meters long and over 16 meters wide and has a virtually unlimited sailing range, having all amenities on board for the crew. The trawler is not only a powerful ocean-going ship, but also a highly mechanized factory, which virtually processes the catch into fish conserves. [LD030128 Moscow Maritime Service in Russian 0800 GMT 1 Oct 80 LD]

NEW DRY CARGO SHIP--A new ship has been built at the Linskorneburg shipyard, the first of five dry cargo ships in the series; it is named the "Kapitan Antipov." Seaworthiness trials confirmed the ship's maneuverability. It is 95 meters long and may take on board up to 4,000 tons of cargo and reach speeds of over 20 km per hour. A festive ceremony was held to mark the handing over of the ship to the Soviet Danube fleet. [LD030128 Moscow Maritime Service in Russian 0800 GMT 1 Oct 80 LD]

ICEBREAKER RETURNS--The first to return to Vladivostok from a polar expedition is the icebreaker "Moskva." For almost 6 months the ship was engaged in heading convoys in the northern latitudes of the Pacific coastline, in the seas and straits of the eastern sector of the Arctic. The other icebreakers of the Far Eastern Line will soon be returning to port--the icebreakers "Yermak," "Admiral Makarov Lednyak" and the "Vladivostok." After repairs they will once more set off for the Okhotsk Sea. Navigation here goes on all year round. [LD030128 Moscow Domestic Service in Russian 2200 GMT 1 Oct 80 LD]

RO-RO SHIP COMPLETED--Leningrad--The flag has been raised on a new MV built at the Zhdanov yard on order from Yugoslavia. The ship uses the horizontal freight handling method--the ro-ro method. A series of such boats is now being built at the yard destined to transport containers and various wheeled machinery. In one trip the ro-ro can transport up to 600 Zhiguli-size cars. [LD030128 Moscow Domestic Service in Russian 2200 GMT 1 Oct 80 LD]

RESCUE TUG SAILS--The rescue tug "Kapitan Afanasyev" has set out on an eastward course from the Kara Strait in the Arctic. It is towing a self-propelled crane made by the Hungarian firm "Ganz" to the mouth of the river Ob, where it will be taken over by the oil and gas workers of the Tyumen region. The path for this awkward tug-crane tandem through the ice of the Kara Sea is cut by the atomic icebreaker "Lenin." After delivering the crane, the tug will resume its east-bound journey as far as the port of Tixi in the Laptev Sea. [LD030128 Moscow TASS in English 1607 GMT 2 Oct 80 LD]

CSO: 1829

MISCELLANEOUS

YAKUTIYA: TRANSPORTATION PROBLEMS

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 25 Jul 80 p 2

[Article by A. Zobnin, Yakutskaya Obkom transport and communications department head: "Freight Routes of Yakutia"]

[Excerpt] In the forthcoming decade, we must put new enterprises into operation and begin building an electric power plant in Arktika; large mineral deposits will be developed. In this connection, the tautness of shipping will increase sharply, and the very structure of shipping will change as well. Whereas today Yakutia basically ships in freight, shipments out will predominate in the not so distant future. And we will be shipping out transport-intensive types of output such as coking coal, iron ore, phosphate fertilizers, petroleum and gas.

Not everything is going as well as one would like in this area. Let us turn again to river transport. Under the conditions which have now developed, the foremost problem is to supplement the fleet. The oblast party committee has placed it before the appropriate authorities again and again. A special resolution was adopted to allocate additional ships to the Lena River United Steamship Line.

But how is the RSFSR Ministry of the River Fleet carrying out this instruction? The steamship line here has received half the planned number of thousand-ton and "two-thousander" ships. Not one ship of the 13 planned has arrived for the small rivers, where the deficit is most critical. In fact, we need not simply reinforcements, but a reserve so as to be free to maneuver. Otherwise, this is what happens: today, the main fleet is hurried to Vilyuy, where the navigation period is only three 10-day periods long, while in Lensk and Yakutsk, dock-worker brigades stand idle, with nothing to unload.

Another river transport problem is port equipment. Two years from now, a new wharf able to handle 600,000 tons of freight per year is to begin operating in Onetrovo. However, Ministry of Transport Construction subdivisions have still not begin work on it. Evidently, the client, the RSFSR Ministry of the River Fleet, has put insufficient pressure on them to do so. Judging by the planning tempo, the USSR Ministry of Nonferrous Metallurgy will not have built the Lensk wharf on schedule.

It is obviously legitimate in this situation to ask about somehow easing the strain on the republic's main transport line, which can be done by changing the plan for delivering freight to the Arctic regions.

Fuel, equipment and products are currently being delivered literally tens of thousands of kilometers to Deputatskiy Ore Enrichment Combine. And it takes nine months to deliver them. And it's not just the Deputatskiy. Northern Yakutia enterprises receive a third of their freight after a year in shipment, sometimes two years. The long runs, seasonal shipping delays and repeated transshipments add up to the fact that transport expenses comprise 60 percent of the cost of new construction beyond the polar circle.

Delivery by the North Sea route cuts the distance two-fold and the time even more. Incidentally, that is the way the Arctic regions used to be supplied. Then these shipments became, it was thought, too expensive. But now the situation has changed: experience has been accumulated in sailing the Arctic seas; powerful ice-breakers have been built and the navigation period is thus longer. This provides an opportunity to significantly increase shipments by the northern route to Yakutia as well. It should be said that the USSR Ministry of the River Fleet has done much in this area in recent years. The Northeastern Administration's fleet has been reinforced. A new wharf is being built in Tiksi. Hundreds of thousands of tons of freight is to arrive by the northern route during the current navigation season. But seagoing ships cannot enter the mouths of the northern rivers, which means, again, transfers and the necessity of holding the river fleet here. During the last navigation season, above-normative seagoing ship idle time just in the mouth of the Yana cost 10 million rubles. In order for seagoing and "river-sea" ships to be able to sail unimpeded, we need to deepen the mouths of the Yana, Indigirka and Kolyma. We have put this question many times to the RSFSR Ministry of the River Fleet and the USSR Gosplan. The answer has always been the same: there are no seagoing-class hydraulic dredges.

Neither can we remain silent about intraregion freight delivery and shipping locally-produced output. The primary role here is played by motor vehicles -- 93 percent in terms of volume of freight shipped. But motor transport means first of all roads.

In discussing the CPSU Central Committee and USSR Council of Ministers Decree "On Measures to Improve the Construction, Repair and Maintenance of the Country's Roads," the Yakutskaya Obkom and the republic Council of Ministers outlined a program of continued road construction and development. I should like to see the RSFSR Ministry of Roads, by being more attentive to the urgent needs of our republic for road construction, help us as fully as it can to carry out this program, which will permit the more efficient use of the motor vehicle fleet.

The KamAZ's, which is what we are basically receiving now, have recommended themselves well in Yakutia. The only bad thing is that the RSFSR Ministry of Motor Transport has not concerned itself with preparing the production-technical base for servicing them. During the five-year plan, not one ruble of centralized capital investments has been released for these purposes. Incidentally, this ministry is concerned equally little about its own people. Motor transport workers are experiencing a critical housing shortage. The 10th Five-Year Plan planned the construction of only one wooden 16-apartment house through centralized capital investments...for a collective of 6,500 people.

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USSR: 1479

MISCELLANEOUS

HYDROTRANSPORT PROSPECTS OUTLINED

Kiev POD ZNAMENEM LENINIZMA in Russian No 16, Aug 80 pp 18-19

[Article by Candidate of Technical Sciences Vadim Mikhaylovich Karasik, department head at the Hydromechanics Institute of the Ukrainian SSR Academy of Sciences: "Transport With Great Possibilities"]

[Excerpts] The "Basic Directions of Developing the USSR National Economy in 1976-1980" speak of accelerating the rates of development of pipeline and water transport. However, not everyone knows what such transport is, where and for what purpose it is used, and what its features and advantages are as compared with other means of transport, and the investigations by scientific workers along these lines. Responding to these questions from our correspondent was Candidate of Technical Sciences Vadim Mikhaylovich Karasik, department head at the Hydromechanics Institute of the Ukrainian SSR Academy of Sciences.

These days, mainline hydrotransport is being used successfully at several ore-enrichment combines to ship ore concentrates. Estimates testify to the economic expediency of building pipelines with a productivity of 20 million tons per year for distances of about 150 km. It is interesting that all the calculation variants for different conditions and distances indicate the cost of shipment by hydrotransport is still considerably below transport by rail. In particular, it is also advantageous for a certain group of freight because it permits combining transport and technological processing of the freight simultaneously. Let's say, in transporting wood scrap and chips, where they continue their processing by being washed.

All the enumerated types of transport (to which we should also add pneumatic transport, which is close to being an "important" type of transport in its general principles) must find their place in the general mainline pipeline transport scheme.

If we are speaking about regions with developed industry, pipeline transport can be used successfully to take the strain off of existing types of transport. This is very important for regions in which "hired" transport has no reserves in case enterprise production capacities increase. In the Ukraine, the Krivoy Rog basin would be an example.

The present level of equipment development, moreover, enables us to lay pipe on the bottom of large reservoirs, which provides definite grounds for examining possible

pipeline routes along the bottom of the Sea of Azov from the Kerch' iron ore deposit to Zhdanov. By rail, the ore would have to be shipped 670 km, but the pipeline route might not exceed 200 km.

Scientists and designers are currently agitated about the problem of eliminating shortcomings in pipeline transport.

Thus, for instance, when the concentration of substances being transported exceeds the permissible norm, hydraulic resistance in the pipes increases sharply, which means we need additional pump stations and additional energy, which means unnecessary expenditures. We must also take into account the fact that installations for making the pulp, that is, the mixture of material being transported, are also not inexpensive. One other substantial shortcoming is that there are many substances which cannot be transported wet at all -- cement, sand, and others. By the way, cement losses in shipment by rail often reach 30 percent. Were we to succeed in finding a way of transporting it "dry" using pipes, it would enable us to reduce losses to a minimum.

Scientific workers at Dnepropetrovsk Mining Institute had a bold idea -- transport "dry" freight by pipe using a capsule or containers. Over several years, they carefully researched the feasibility of transporting coal and ore in this way. Today, they are talking about developing optimum procedures for transporting in this way and designs for the capsules themselves -- there are in operation experimental installations with pipelines of different diameters. Capsule-containers which can hold up to several tons of freight can move through large-diameter pipes like unique trains.

This container method has major advantages, which can be illustrated in an interesting way using sand as an example. If sand is "driven" through pipes, it turns out that the larger the grains of sand, the more energy is needed to move them. On the other hand, slow speeds lead to a situation in which the grains of sand do not want to move and settle to the bottom. But if that same sand is put, let's say, into aluminum capsules, the size of the particles no longer matters. Moreover, it is considerably easier to set the capsules in motion. All this substantially reduces losses of energy in transport.

The shape of the containers themselves is also of important significance. Spherical and cylindrical capsules are being tested. When spherical capsules move, the hydraulic resistance turns out to be less, inasmuch as a sphere floats easily in the current, and the layer of water around it reduces resistance to the forward motion. Therefore, they even outraced the flow of water in experiments with aluminum and plastic spheres, reaching speeds 5-8 percent higher. And cylindrical capsules moved 15 percent faster than the flow.

The problem of moving the capsules with a flow of petroleum is also promising. It is quite feasible to use existing oil pipelines for hydrotransport: petroleum's higher viscosity than water ensures better suspension of the capsule. Moreover, petroleum forms a comparatively thick layer of paraffin on the walls of the pipe, reducing friction.

But here, scientists encountered one more problem, that of distance. If the length of the route is dozens of kilometers, the energy of one pump station does not suffice for successful transport. If pulp is being transported, everything is easy:

additional pump stations are installed on the route to "boost" the flow of liquid. In this case, pulp goes right through the pump. But what about if containers are used? They would not pass through the vanes of the pump, so we would need special shut-offs and locks, and so on. Finally, what would we do with the empty shells after unloading? It would be inexpedient to haul them back. It might be most convenient to use single-use shells manufactured of a material which would also be processed at the destination station. We are currently seeking out such materials.

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MISCELLANEOUS

'TRANSPROGRESS' PIPELINE SYSTEM OUTLINED

Description of System

Baku VYSHKA in Russian 30 Sep 80 p 3

[Article by TASS correspondents Ye. Buyanov and A. Sul'din, Orekhovo-Zuyevo, Moscow Oblast: "'Transprogress' Express"]

[Text] The lack of roads is no obstacle to the transport created at the capital's special "Transprogress" design bureau. TASS correspondents who visited the test grounds in the Moscow suburb of Orekhovo-Zuyevo were convinced of this. The white threads of pipeline through which freight containers move at speeds of up to 50 km per hour were laid through swamps, across hills and ravines. The motive power is... air.

"This transport system is still strange," said A. Korkin, deputy chief of the special design bureau. "The containers move on multiple-axle trollies in response to a small positive air pressure. The train, with two sides, has special gaskets which seal the gaps tightly and which serve as a unique sail.

We saw such a consist at a mechanized loading station. It came out of the pipe on a special gantry. Using a crane, each container is loaded with upwards of four tons of stone, but other building materials, agricultural output and minerals can be transported in similar fashion. The compressor is switched on and the train plunges into the tunnel, picking up speed.

We can see on the central control panel display where each consist is in the many kilometers of pipeline. Dispatcher L. Karabanova operates the control panel keyboard smoothly and the echelons pick up speed, slow down and are unloaded under her competent hands.

We lower ourselves down into the pipe through a special opening like a spaceship hatch. Engineers and workers regularly enter this tunnel, slightly more than a meter in diameter, to check the condition of the internal surfaces of the pipe.

The welded pipe seams sparkle in the flashlight's light. Suddenly the metallic play of colors changes to white.

"Now we're at the concrete sections," explain the specialists. "They are cheaper, have a longer service life and are not subject to corrosion. Work is going on to

find ways of using asbestos-cement, reinforced concrete and plastic pipe. We might also use reject petroleum and gas pipeline pipe."

Each installation is unique. In fact, they were created for specific enterprises with consideration of terrain, climate and type of freight. The productivity of the route is therefore not always the primary indicator. A younger brother of this installation was "born" at the same time: using it, books will be supplied to the reading rooms in the State Library imeni V. I. Lenin from storerooms.

The pneumatic system was also the basis for creating intraplant transport to ship parts from shop to shop. The special design bureau also created a complex of units to collect and transport household wastes for reprocessing.

This is the future, but the designers already have an assignment for beyond that. In one laboratory, we were shown the equipment, although still only a mock-up.

In conclusion, we interviewed A. Aleksandrov, chief of the special design bureau. "The 'Transprogress' system solves the problem of saving considerable fuel, and gasoline in particular. It is safe, quiet, reliable and durable. Its service life is about 40 years. There is no possibility that the environment will be polluted. In accordance with the resolutions of the 25th Party Congress, it has been decided to use such installations extensively in the national economy. The system is working well in Georgia and is being built in Volgograd, Leningrad and Saransk."

Additional Details

Moscow GUDOK in Russian 1 Oct 80 p 4

[Excerpts] "Our route," says Lyudmila Sergeyevna [Karabanova, dispatcher], "was designed to ship one million tons of freight per year. Further improvement in control automation will enable us to increase freight turnover."

At the test grounds, the pipeline transport system is tested both as a whole and by individual subassembly and unit. For example, like aircraft, the containers are subjected to a strong flow of air in a wind tunnel. The trains are checked for strength on a braking test stand and the consist wheels are "rolled" the warranty life of 40,000 kilometers. Automatic equipment is also checked.

The plan is to build dozens more such installations. Their introduction will free many thousands of vehicles for other work.

This system, designed based on more than 100 inventions, has a good future.

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CSO: 1829

MISCELLANEOUS

TRANSCASPIAN GAS PIPELINE

Moscow STROITEL'NAYA GAZETA in Russian 10 Sep 80 p 3

[Text] A collective of scientists and specialists at the underwater pipeline department of Gipromorneftegaz Institute have finished drawing up the technical and economic substantiation for the country's first transcaspian gas pipeline, from Turkmenia deposits to the Caucasus coast, ahead of schedule.

Its underwater section alone, intersecting the Caspian from east to west, will be 225 kilometers long. New little towns with all the amenities will spring up for pipeline construction workers and operators along both sides of the sea on the "inland" sectors of the route.

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